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DELAWARE RIVER BASIN: SCHUYLKILL RIVER. A COOPERATIVE STATE-FEDERAL REPORT ON WATER POLLUTION CONTROL

Public Health Service
Cincinnati, Ohio

April 1954

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DELAWARE RIVER BASIN

SCHUYLKILL RIVER

A Cooperative State-Federal Report on Water Pollution Control

PENNSYLVANIA
Sanitary Water Board
Department of Health
THE INTERSTATE COMMISSION
ON THE DELAWARE RIVER BASIN

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U.S. DEPARTMENT OF
HEALTH, EDUCATION, AND WELFARE
Public Health Service
North Atlantic Drainage Basins

REPORT ON WATER POLLUTION CONTROL

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Prepared by

U. S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service
Division of Water Pollution Control
North Atlantic Drainage Basins Office

April 1954

In cooperation with the:

Sanitary Water Board
Pennsylvania Department of Health

The Interstate Commission on the Delaware River Basin

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DELAWARE RIVER BASIN

SCHUYLKILL RIVER

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INTRODUCTION

The Federal Water Pollution Control Act, Public Law 845, passed by the 80th Congress in June of 1948, provides for full recognition of the primary responsibilities and rights of the States in controlling water pollution. It requires the Surgeon General of the Public Health Service to cooperate with other Federal agencies, with State and interstate water pollution control agencies, and with municipalities and industries in the preparation or adoption of comprehensive programs for eliminating or reducing the pollution of interstate waters and tributaries thereof, and improving the sanitary condition of surface and underground waters.

In developing these programs, due regard must be given to improvements necessary to conserve the nation's waters for public water supplies, propagation of fish and aquatic life, recreational purposes, agricultural, industrial, and other legitimate uses.

As a first step in carrying out this requirement, the data available as of July 1, 1950, were presented in summary type reports covering the major drainage basins in the United States, the data concerning the Delaware River Basin being presented briefly in the summary report on the North Atlantic Drainage Basins. The summary report considered the water pollution problems of the Delaware River Basin as a whole.

This report contains pollution data available as of April 1954, and relates to water pollution control measures in the Schuylkill River Basin which discharges to Zone 3 of the Delaware River Basin. It is the last of a series of five such reports which, together, cover the entire Delaware River Basin. Previously published reports in the series are:

Report on Water Pollution Control - Delaware River Basin, Zone 3
(Exclusive of the Schuylkill River Basin)
Water Pollution Series No. 41, PHS Publication No. 239, May 1952.

Report on Water Pollution Control - Delaware River Basin, Zone 2
Water Pollution Series No. 48, PHS Publication No. 273, Sept. 1952.

Report on Water Pollution Control - Delaware River Basin, Zone 4
Water Pollution Series No. 58, PHS Publication No. 295, April 1953.

Report on Water Pollution Control - Delaware River Basin, Zone 1
Water Pollution Series No. 63, PHS Publication No. 363, Jan. 1954.

Water pollution control in the Schuylkill River Basin has been given considerable study by the Sanitary Water Board of the Pennsylvania Department of Health; the Water and Power Resources Board of the Department of Forests and Waters; and the Interstate Commission on the Delaware River Basin (Incodel) a joint agency of the four Delaware River Basin States. Pollution control activities of these agencies are supported by State laws relating to intrastate water pollution and the Incodel laws which have been passed by each of the Basin States in the form of reciprocal legislation for the control of the interstate Delaware River and its tributaries.

The Incodel laws enacted: New Jersey - Chapter 146, July 1, 1939; New York - Chapter 600, May 31, 1939; Delaware - Chapter 93, May 8, 1941; and Pennsylvania - Chapter 123, April 19, 1945; provide for the minimum degree of treatment of wastes discharged in each of four zones of the interstate Delaware River. The zones established under these Acts and the principal water uses designated are as follows:

ZONE 1: Zone 1 is that part of the Delaware River and its West Branch extending from the New York-Pennsylvania boundary line to the head of tidewater at Trenton, New Jersey and Morrisville, Pennsylvania.

The drainage basin contributory to this zone, excepting part of the Lehigh River Basin, is relatively sparsely inhabited and contains few sewered communities and relatively few industrial establishments producing waste water. The streams draining this area being, in general, relatively clean and of high elevation, are well adapted as sources of public water supplies, after treatment or purification.

The principal uses of the waters of the Delaware River in Zone 1 are expected to be for water supply after such treatment or purification as may be necessary, and for recreation, bathing, maintenance of fish and aquatic life, agriculture, and for other related purposes.

ZONE 2: Zone 2 is that part of the Delaware River extending from the head of tidewater at Trenton, New Jersey and Morrisville, Pennsylvania to a line drawn perpendicular to the channel of the Delaware River from the mouth of Pennypack Creek in Philadelphia, Pennsylvania, to the corresponding point on the New Jersey shore.

The drainage basin contributory to this zone is somewhat more densely populated than that of Zone 1, and it contains more sewered communities and industrial establishments.

The principal uses of the waters of the Delaware River in Zone 2 are expected to be for water supply, after treatment or purification, and for recreation, navigation, maintenance of fish and aquatic life, agricultural, industrial and other purposes.

ZONE 3: Zone 3 is that part of the Delaware River extending from the aforesaid line connecting the mouth of Pennypack Creek in Philadelphia and the corresponding point in New Jersey to the Pennsylvania-Delaware boundary line.

The drainage basin contributory to this zone contains populous metropolitan areas including Philadelphia, Pennsylvania and Camden, New Jersey.

The principal uses of the waters of the Delaware River in Zone 3 are expected to be for navigation, industrial water supply, and other purposes.

The water in this zone, however, should be of such sanitary quality that

it will not be unfit for use as sources of water supply, will not be harmful to fish life, and will not adversely affect the quality of the waters of the tidal tributaries.

ZONE 4: Zone 4 is that part of the Delaware River extending from the Pennsylvania-Delaware boundary line to the Atlantic Ocean.

The principal uses of the waters of the Delaware River in Zone 4 are expected to be for navigation, industrial water supplies, commercial fishing, shellfish culture, recreation and other purposes.

This report describes the status as of April 1954 of the comprehensive water pollution control programs conducted by the Sanitary Water Board of the Pennsylvania Department of Health, the Water and Power Resources Board of the Department of Forests and Waters, and Incodel in the Schuylkill River Basin section of the drainage area contributory to Zone 3 of the Delaware River Basin. It sets forth information about the ways the water resources of the area are used, the pollution entering those water resources and the resulting damages, the benefits which may result from pollution prevention and abatement, pollution prevention measures in effect, and those which appear to be needed. Its scope is limited to surface water pollution control. Ground water pollution has not been considered in the report although usage of ground water is mentioned. While it is true that additional information is needed to complete the program, the objectives have been established and general plans for attaining them have been adopted by the States and Incodel. The program is well advanced with the major portion aimed toward completion by 1955.

The data on which this report is based have been compiled through and in cooperation with the Sanitary Water Board of the Pennsylvania Department of Health and Incodel. Through these agencies additional data have been obtained from other State officials, municipal officials, and representatives of industry. Federal agencies also have cooperated.

The detailed data and remarks relating to individual sources of pollution appearing in Basic Data Tables 1 and 2 are the determination of the State water pollution control agency and are included to illustrate the status of the program as of April 1954.

Comprehensive programs for pollution control must necessarily be fluid. They must allow for growth, development and changing conditions. The program now in effect in this area appears to fit the current needs. Reappraisal in the course of time will provide for adjustments as the need arises.

A sincere effort has been made by all who contributed to this report to present a fair picture of the complex water pollution problems in the Schuylkill River Basin and to present reasonable conclusions and recommendations. It is our hope that this report will help in safeguarding the water resources in this area.

ACKNOWLEDGMENTS

The Public Health Service wishes to acknowledge the cooperation and assistance of those agencies and individuals that have contributed to the preparation of this report.

The Sanitary Water Board of the Pennsylvania Department of Health has furnished the data from which the various tables were prepared and other data and information contained in the narrative statements. The Interstate Commission on the Delaware River Basin also supplied considerable data and drafted the major portion of the report. These agencies have, in addition, reviewed the preliminary draft and offered valuable comments and suggested changes. The preliminary draft has also been reviewed by the Delaware Water Pollution Commission, the New Jersey State Department of Health, and the New York State Department of Health. In general, the preliminary draft has been revised so that this report is in agreement with the comments and suggestions of the participating State and interstate agencies.

Federal agencies from which assistance was obtained include the Corps of Engineers, Department of the Army; the Geological Survey, the Fish and Wildlife Service, the Bureau of Mines and the National Park Service, Department of the Interior; the Bureau of the Census and the Weather Bureau, Department of Commerce; and the Soil Conservation Service, Department of Agriculture. The report was reviewed and cleared by the Federal Inter-agency River Basin Committee.

Finally, there is acknowledged the assistance of other State and Federal agencies and individuals interested in water resources development and conservation that have contributed information through other sources than those listed above.

SUMMARY

The Schuylkill River is a striking example of a stream so wantonly abused it became little more than a common sewer and which, through Herculean efforts, struggled back in many reaches to a degree of respectability commensurate with existing uses and the status of technical knowledge applicable in rehabilitating such a stream. In its early pristine state it formed a scenic transportation route for delivering the anthracite coal produced in its headwaters to the markets downstream. Coal production was the principal factor causing its gross degradation.

Much of the flow in the headwaters consists of mine drainage, heavily impregnated with naturally formed acid. The water is low in pH, high in sulfate hardness, iron and manganese. Aquatic life cannot exist and it is useless for beneficial purposes without extensive treatment. Since the stream was already an object of disdain because of its poor chemical quality, it was heaped with further abuse by the sediment resulting from coal cleaning operations and erosion of culm piles which accumulated around the collieries and breakers. Thus, with an acid stream already heavily laden with culm, little interest was shown in protecting the Schuylkill from other types of industrial wastes and municipal sewage.

By 1945 the legislature of the Commonwealth of Pennsylvania took cognizance of the situation and stated in the preamble to the Schuylkill Desilting Act that:

"The accumulation of wastes from mining operations, industrial processes and municipal sanitation in the Schuylkill River and its tributaries has reached the point where it constitutes a menace to health, safety and welfare of the public; has endangered and contaminated the supply of pure waters; and is primarily responsible for the frequent floods resulting in the spreading of disease and great loss of life and property.

"It is imperative for government to exercise due diligence and reasonable control, and to provide appropriate services in the matter of the development and conservation of human and natural resources.

"It is necessary to continue the proper relationship and divisions of responsibility among the Federal, State, and local levels of government under which this Nation has operated so successfully.

"It is a fundamental public right to require streams to be reasonably free of pollution and other objectionable forms of contamination."

Thus read the preamble to the Act which empowered the Water and Power Resources Board of the Department of Forests and Waters to carry out the Schuylkill River desilting project. Coupled with this the Sanitary Water Board of the Department of Health, through an amendment to the 1937 Clean Streams Act, was empowered to prohibit further discharges of culm and other sediments from the coal mines and industrial establishments.

This report summarizes the current status of the situation in the Schuylkill River Basin, the transformation of which resulted largely from the 1945 legislative Acts.

This basin is part of the area contributory to Zone 3 of the Delaware River Basin. It contains about 1,915 square miles of southeastern Pennsylvania, including a large portion of the City of Philadelphia. It extends for some 130 miles from its mountainous headwaters southeasterly to its mouth in Philadelphia with an approximate width of 21 miles. Most of Berks and Montgomery Counties lie in the Schuylkill River Basin, a large part of Carbon, Schuylkill and Philadelphia Counties and a small portion of Lebanon, Chester, Bucks and Lehigh Counties.

The estimated 1950 population is 680,000 not including that portion of Philadelphia lying within the basin, and about 1,400,000 including the Schuylkill Basin portion of Philadelphia, an increase of 8½% over the 1940 census figures. The largest municipality is, of course, the city of Philadelphia. Reading is the next largest followed by Lower Merion Township and the Borough of Norristown.

Philadelphia is the center of industry in the lower basin. The City of Reading, located about the geographical center of the basin, is the business center for the surrounding agricultural region. It is noted for its textile, steel and many other diversified industries. Pottsville, located in the upper part of the watershed, is the center of the anthracite mining industry in that part of the anthracite region. Recently a number of clothing and other industries have moved into the Pottsville area thus helping to revive its economy so adversely affected by the dwindling anthracite mining industry.

Water supply for municipal and industrial requirements is obtained from both surface and underground sources. Public water supply systems utilize about 225 million gallons daily (mgd) of which more than 90% is obtained from the Schuylkill River and its tributaries. Philadelphia takes about 170 mgd of this amount, which is approximately one-half its total requirement, the other half being obtained from the Delaware River. This amount incidentally approximates the recorded low flow of the Schuylkill River at Fairmount Dam. The Philadelphia Suburban Water Company uses about 13 mgd from tributaries of the Schuylkill. Reading obtains its supply of 15 mgd from Maiden Creek. Almost the entire population of the Schuylkill Basin is within reach of a public water supply.

Industrial establishments utilize about 150 million gallons daily. Of this amount about 25 mgd is furnished by public water supply systems and 125 mgd is obtained from private industrial supplies.

Pollution which has contributed so strikingly to the degradation of the Schuylkill River, can be classified in five major categories according to source: acid mine drainage, culm and silt from coal operations, municipal sewage including wastes from those industries in the municipalities which contribute to municipal sewers, industrial wastes from industries discharging directly to watercourses, and silt from soil erosion of agricultural land, denuded areas, construction work, spoil, and the like.

Acid mine drainage, which constitutes the major flow in the headwater areas, is by far the most damaging type of pollution at the present time. However, little is known concerning the control of this waste. Its quantity is being reduced to the extent possible through diversion of surface waters, and backfilling of surface mines. The remainder must be allowed to flow until it becomes neutralized in time by mixing with alkaline waters flowing from tributary streams. Because of lack of knowledge to control this type of pollution, its discnarge is largely exempt from the present Clean Streams law.

The second major source of pollution, and even more damaging in the past than acid mine waste, is the culm and other sediment washed from the coal during its processing for market. This material, which represented at times in the past as much as 15% of the total mine production, accumulated in the stream beds and gradually was washed downstream. Thus flood hazards were increased in the upper portion of the basin and navigation channels were choked in the tidal section of the Schuylkill and the Delaware. It is estimated that dredging costs to maintain navigation channels below Fairmount Dam were increased approximately a half million dollars annually as a result of this sediment. Oddly enough, dredgers have for years profitably recovered coal from the river for sale to power plants and other users capable of burning fine sizes.

In the Schuylkill River restoration project the Department of Forests and Waters removed some 24 million cubic yards of culm deposits and silt from a 76 mile stretch in the river above Norristown. The Corps of Engineers, Department of the Army, is currently removing an estimated 10 million cubic yards of culm between Norristown and Philadelphia. The Sanitary Water Board has required the elimination of further discharge of coal and other sediments from coal mining operations. The river now is flowing clear again after many years of appearing more like ink than water. There are now industrial waste treatment facilities for removing sediment from wastes at all of the 38 coal washeries in operation in the Schuylkill River Basin. This figure is included in the industrial wastes data mentioned later.

Municipal pollution, the third major category, comes from 78 municipalities in which a little over a million people are served by the sewer systems. Treatment is regarded adequate in 25 of these municipalities involving 154,000 population. Most of the remaining pollution originates from the 35 municipalities in which projects are needed for pollution control involving 894,000 population. The balance is from 18 municipalities whose needs have been undetermined as yet. They are mostly small communities many of which do not have central sewer systems. The data available indicate only 650 sewered population in these 18 communities.

With the work that is now under construction -- the Philadelphia Southwest Treatment Works which will serve approximately 700,000 people, the additions to the Reading plant which serves 90,000 people, and the connection of Shillington to the Wyomissing Valley Joint Sewer Authority involving 4,000 people -- within the next year we should find the record to show that 28

municipalities will be adequately served by sewage treatment plants accommodating a population of 947,600. The remaining 32 municipalities on which needs have been determined involve 100,000 population. It can be expected, however, another year will see additional construction undertaken because out of these 32 municipalities which need facilities and have not placed them under construction, 22 involving 76,300 population are actively planning their programs. Only 10 municipalities with an aggregate population of 23,800 have not as yet taken positive steps toward correction. In addition to this, of course, are the 18 municipalities on which needs are undetermined most of which are very small but nonetheless important individually in their own areas.

During the period 1946 to 1953 inclusive, municipalities constructed 13 new sewage treatment plants and improved 5 existing plants. These 18 plants serve a total population of more than 130,000, the major portion population-wise of the 154,000 population reported as adequately served by treatment facilities at present.

Industrial wastes, the fourth major category (and possibly third from the standpoint of magnitude, exclusive of colliery wastes, if complete data were available) is derived from 130 industrial establishments. Out of these, 118 provide treatment of some sort and only 12 have no treatment whatsoever -- a record in all probability unmatched in any other heavily industrialized area of this nature. As one would expect, due to changing circumstances, obsolescence, growth and other factors, all treatment facilities will never be 100% adequate. Improvements must be made constantly. Such is the case here where 87 of the treatment facilities are regarded as adequate out of the 118 provided. This, however, is a reasonably good percentage. In all probability some of the difference between the 87 adequate treatment facilities and the 118 facilities provided will be found satisfactory upon further investigation because current records indicate that only 22 new or improved treatment facilities are needed whereas determinations have not been made on 21. Two industrial waste treatment plants are under construction, 10 companies are planning their waste facilities and 10, who are lagging behind the parade, are listed as inactive or undetermined.

Fifty-six of the industrial establishments discharge wastes primarily organic in character. Such wastes contribute to the bio-chemical oxygen demand of the stream and may putrify if not adequately diluted. The remaining 74 discharge inorganic wastes which contribute primarily to turbidity and sediment deposits if discharged without treatment.

During the period 1946 to 1953 inclusive, 74 new industrial waste treatment plants and one enlargement were constructed. In addition many other industrial plants made connections to municipal sewer systems and thus eliminated their waste discharges to the streams.

The fifth major source of pollution is silt from soil erosion. Silt not only builds up in stream channels thus reducing carrying capacity but it also contributes to increased costs of water treatment and dredging in navigation channels. It is one of the most damaging forms of pollution to fish life in

that it clogs gills, deposits on nesting areas, and deleteriously affects fish food organisms. Erosion is a major problem in the upper portion of the basin where large quantities of culm and silt are washed by rain and flood waters from the culm banks and strip mining operations. While efforts are being made to minimize these occurrences, they cannot be prevented entirely. Desilting basins are provided behind dams in the river for removing such material. They are dredged as necessary to prevent excessive accumulations.

As a result of the progress accomplished to date, the five municipalities between Philadelphia and Reading which obtain their water supply from the Schuylkill River report improved water quality and more economical operating conditions in their water treatment plants. Industries are benefiting from a cheaper and better industrial water supply. Coal operators are developing markets for coal which was formerly discharged into the river, and the lowering of the flood plain has resulted in less flood damage, better real estate values, and improved recreational opportunities.

In other portions of the basin soil erosion is not a serious problem. Moderate sheet erosion exists in parts of Montgomery, Chester and Berks Counties. Soil conservation districts have been established in Berks and Chester Counties and aid has been given by the United States Soil Conservation Service. The State Forestry Department of the Pennsylvania Department of Forests and Waters is chiefly responsible for better forest conservation in the basin. The greatest need lies in the coal regions where large areas have been denuded and reforestation of these areas is a major problem.

It can be seen from the foregoing that much has been done to bring about the restoration of the Schuylkill River to the desired quality of water for the expected principal uses of municipal and industrial water supply, fishing, recreation and other uses. The completion of the program for the removal of coal culm and silt from the river by the Pennsylvania Department of Forests and Waters and the Corps of Engineers of the Department of the Army, together with the completion of the program of the Sanitary Water Board of the Pennsylvania Department of Health for the abatement of municipal and industrial pollution to restore the waters in the river to the most appropriate state of usefulness, will be outstanding accomplishments in the field of river basin restoration. The fact that this program is well along with the major portion scheduled for completion in 1955 is a commendable achievement.

A list of municipalities and industries needing improvements as of April 1954 for abatement of pollution in the Schuylkill River Basin is set forth in Table J. Basic data as of this same date on the sources of municipal and industrial pollution appear in Tables 1 and 2 in the Appendixes. A statistical summary of some of the data set forth in the report is shown in the following tabulation.

DELAWARE RIVER BASIN
SCHUYLKILL RIVER
Summary Statistics on Pollution
April 1954
Extracted and Condensed from Tables in the Report

	Sources of Pollution	
	Municipal*	Industrial**
Number	78	130
Population Served	1,048,350	-

	Existing Waste Treatment Facilities				
	Municipal*				Industrial**
	Primary Treatment	Secondary Treatment	No Treatment	Treatment	No Treatment
Number	3	28	47	118	12
Population Served	9,450	250,400	788,500	-	-

	Waste Treatment Needs					
	Municipal*			Industrial**		
	No Project Needed	Project Needed	Undetermined	No Project Needed	Project Needed	Undetermined
Number	25	35	18	87	22	21
Population Served	153,600	894,100	650	-	-	-

	Current Status of Action on Known Treatment Needs					
	Municipal*			Industrial**		
	Under construction	Planning or Plans Approved	Inactive or Undetermined	Under construction	Planning or Plans Approved	Inactive or Undetermined
Number	3	22	10	2	10	10
Population Served	794,000	76,300	23,800	-	-	-

	Status Upon Completion of Works Under Construction					
	Municipal*			Industrial**		
	No Project Needed	Project Needed	Undetermined	No Project Needed	Project Needed	Undetermined
Number	28	32	18	89	20	21
Population Served	947,600	100,100	650	-	-	-

* Includes incorporated or unincorporated municipalities, other legal bodies as sanitary districts, counties, towns, significant institutions, resorts, recreational centers, or other population centers.

** Industries having separate outlets discharging wastes directly to water course. The waste from industries which discharge into a municipal sewer system are included in the municipal discharge.

CONCLUSIONS

A review of the data contained in the report indicates the following conclusions:

1. The Schuylkill River and its tributary streams from Fairmount Dam in the City of Philadelphia to Maiden Creek above the City of Reading are generally of satisfactory quality to meet the needs of municipalities and industries for all appropriate purposes. The tidal section of the Schuylkill River, and the headwater tributaries receiving mine drainage, are of relatively poor quality, particularly during minimum flow periods in late summer and fall.

2. The coordinated efforts of the Sanitary Water Board of the Pennsylvania Department of Health, the Water and Power Resources Board of the Department of Forests and Waters, the Corps of Engineers, Department of the Army, Incodel, and the many municipalities, industries and civic agencies which have cooperated in bringing about an effective comprehensive program for the restoration of the Schuylkill River, have set a precedent in river restoration activities in the United States.

3. Data concerning municipal sources of pollution are reasonably complete, while additional information concerning the pollution load and the abatement programs of the industries discharging wastes to the streams of the basin are inadequate and incomplete.

4. The coal culm and silt washed into the streams of the upper Schuylkill basin from mining operations and culm banks are potential sources of pollution. The desilting operations at the mines must be continued by the mine operators and maintenance dredging at the intercepting basins by the Department of Forests and Waters is necessary to protect the river from a recurrence of the silt menace.

5. Soil conservation and reforestation programs which have been initiated and established throughout the region can be of substantial benefit if vigorously promoted.

6. The program of the Sanitary Water Board of the Pennsylvania Department of Health to promote economical methods to prevent the formation of and to treat acid mine waters and other forms of industrial wastes is important to the economy of the region.

7. Activities for informing the public and industry of the necessity for municipal and industrial waste pollution abatement have been fruitful. However, additional effort is necessary to inform the public of the advantages which can be derived by public support in financing municipal abatement projects.

8. The restoration of a river basin such as the Schuylkill is not only desirable and necessary but is economically possible and justifiable.

RECOMMENDATIONS

It is recommended that:

1. The Sanitary Water Board of the Pennsylvania Department of Health, the Water and Power Resources Board of the Department of Forests and Waters, Incodel and other interested governmental agencies and organizations continue their cooperative program to bring about water pollution control projects in a logical and equitable sequence for restoring and preserving the water resources of the region for their maximum appropriate usefulness.

2. Investigations into the sources of pollution, water use, requirements of water resources for municipal and industrial purposes and stream water quality surveys be continued to enable an appraisal of improvements resulting from pollution control, the effects of future municipal and industrial expansion on stream conditions and to determine adjustments that may be needed to maintain the streams for their appropriate uses.

3. Efforts be continued toward the development of proper land use practices in the region for the stabilization of the soil, the reforestation of denuded lands, and the conservation of the water resources.

4. The governmental agencies charged with promoting and controlling stream pollution abatement continue their efforts to enlist public support for pollution abatement projects and other water resources conservation measures.

5. Sufficient funds be provided to the various agencies and levels of government to continue their accomplishments in water pollution control and carry out the above stated recommendations.

REPORT ON WATER POLLUTION CONTROL
DELAWARE RIVER BASIN
SCHUYLKILL RIVER

HISTORICAL BACKGROUND

The Schuylkill River Basin is rich in historical lore. The first paper mill, the early iron furnaces, Valley Forge, and anthracite coal have established its place in history. It is also a spectacular example of a river which is about to complete the economic water cycle from pristine purity to gross degradation by pollution and subsequent recovery to a state consistent with the principal water uses of an industrial civilization.

The Schuylkill River is believed to have been discovered in 1616 by Captain Cornelius Hendrickson, in command of the Dutch vessel, "Onrust." It has been related how the early English settlers, sailing up the Delaware River in search of a new home, nosed their little craft toward the shoreline into a clump of trees and were surprised to find they were sailing up a tributary stream. The first settlement on the Schuylkill was in 1642. Some accounts attribute the name "Schuylkill" to the Indians. Others attribute the name to the early Swedish or Dutch settlers. Despite its origin, it is generally agreed that it means "hidden river."

The stream became an early avenue of navigation and also a means of livelihood by fishermen living in the lower sections. Early Pennsylvania legislators were tormented by the demands of the traders, navigating the river with their furs, lumber and farm products for protection against the fish traps and leads of the fishermen. Equally loud demands of the fishermen for laws against the damage to the structures which spilled the articles of commerce into the river and along its banks also echoed in the legislative halls of the Commonwealth. At one time, laws prohibiting fish traps were enacted to protect the navigators, and at another time, navigation was prohibited by law. Red-blooded men caused riots and bloodshed in both cases, but, eventually, the navigation interests prevailed as flatboats, rafts, arks and other forms of water craft plied down the river when the water was high. The navigators walked back upstream. Upon increasing demand for navigation, improvements were authorized by an Act of the Assembly in 1761, and commissioners were appointed to carry out the work.

It was not until after 1790, when anthracite coal was discovered in the headwater region, that the upper valley development became important. Coal production added to the expansion of the already established iron, paper and textile industries in the valley, so that transportation became an important factor in the growing business of the region.

In 1815, the Pennsylvania legislature issued a charter of incorporation to the Schuylkill Navigation Company to build a canal along the river. Thirty-two dams and seventy-two locks were constructed along the main stem of the

Schuylkill between Port Carbon and Philadelphia, a distance of 108 miles. The canal was not completed until 1826, but the production of coal spurted from 1820 on because of the better transportation facilities. The canals were followed by the railroads and highways, and the use of coal continued to expand. The towns and villages in the Schuylkill valley grew with the coal, iron, paper, lumber and agricultural production in the region.

Water supplies were taken from nearby streams and wastes from the municipalities and industries were discharged directly into them. In the early days of the industrial development, the waste discharges were relatively small and the wastes were assimilated -- all but the culm wastes of coal mining. These wastes were washed by rain into the adjoining streams from the waste culm piles and, in later years, when water became the medium for separating the smaller sizes of coal, culm and coal were discharged directly into the streams. These wastes were carried downstream and deposited behind the navigation dams. After more than a hundred years of mining operations, 30 million tons of coal culm and silt choked the bed and banks of the Schuylkill River for more than a hundred miles.

Municipalities and industries, discouraged by the discharges of coal culm and acid mine water in the upper basin, made no effort to treat their wastes. Despite the fact that a number of municipalities in the lower basin were required to construct primary sewage treatment works, the river became highly polluted from its source to its confluence with the Delaware.

It was not until recent years that pollution abatement laws were strengthened to prohibit the discharge of coal wastes into the streams to aid the effectiveness of the municipal and industrial waste treatment plants that had been built.

PHYSICAL DESCRIPTION

The Schuylkill River Basin comprises approximately 1,900 square miles of the lower Delaware River watershed in southeastern Pennsylvania. It is about 93 air miles long, averages 21 miles in width, and comprises approximately 15% of the drainage area of the Delaware River Basin and 72% of Zone 3. The river rises in the upper reaches of Schuylkill County, about 150 river miles above its confluence with the Delaware River. It flows southeastwardly through the mountainous coal regions for about 25 miles, where it is joined by the West Branch, which has its origin in the mountains above Minersville, and, later, by the Little Schuylkill, which originates to the east above Tamaqua and Lansford.

The three principal branches and their tributary streams which spread fan-like throughout the upper basin wind their way through the mountains of unmined anthracite and their smaller offsprings of culm and slate which have been disgorged from the earth during the last 130 years of mining operations. At their junction below Schuylkill Haven, the river cuts through the Blue Mountain range producing a gap in many respects as interesting as the renowned Delaware Water Gap.

The river enters the lower basin in Berks County above Reading where it is joined by the Maiden and Tulpehocken Creeks. As it winds through the rolling hills below Reading, the Schuylkill is joined by its principal tributaries, the Manatawny, French, Perkiomen, Pickering and Wissahickon Creeks. At Pottstown it becomes the boundary between Montgomery and Chester Counties. The tidal section is within the City of Philadelphia. Elevations range from tidal marshes at the confluence with the Delaware to 1,800 feet in the mountainous coal regions.

The major portion of the southern Pennsylvania anthracite coal field lies within the upper Schuylkill River Basin. Southeast of Blue Mountain, the watershed is located in the Appalachian Valley and in the relatively modern Atlantic Coastal Plain. The lower Schuylkill River Basin is open land, well adapted to agriculture, and intensively farmed. Relatively small areas are devoted to woodland, and these mostly with young growth.

The mean annual temperature in the Schuylkill Basin is 52° F., the mean summer temperature is about 71° F., while the mean for the winter is about 30° F. The annual snowfall averages 36 inches in the northern sections and 23 inches in Philadelphia. The annual precipitation of approximately 45 inches occurs rather uniformly throughout the year and is normally almost ideal from an agricultural standpoint.

Stream flows are usually lowest in August, September and October. There are nine stream gaging stations and 24 precipitation stations of which five are of the recording type. Data concerning stream flows may be found in "Stream Flow Records," issued by the Commonwealth of Pennsylvania's Department of Forests and Waters, Division of Hydrography, Harrisburg, Pennsylvania, and "Surface Water Supply of the United States - Part I - North Atlantic Slope Basins," issued by the United States Department of the Interior, Geological Survey, Washington, D. C. (See Appendix B.)

The use of ground water for domestic and industrial use in this section is considerable, being the only economic source of supply for a number of the municipalities and industries in the region. The Philadelphia Naval Base derives half of its water supply from the unconsolidated deposits underlying South Philadelphia. The water withdrawn from this formation has deteriorated in quality over the past 10 years to the degree that the Naval Base has had to install an expensive treatment plant.

ECONOMIC DEVELOPMENT

The Schuylkill River Basin has a population of approximately 680,000 not including the City of Philadelphia, and approximately 1,400,000 if the portion of the population of Philadelphia tributary to the Schuylkill is added. This population is centered in 10 counties either wholly or partially located in the basin within which are 70 boroughs, 127 townships and three cities including Philadelphia.

The largest portion of the population is located in Philadelphia; however, 20 of the larger municipalities located along the river and its principal tributaries accounted for 289,815 of the population in 1950, a decrease of 2,230 in the period 1940-1950. This decrease can be traced principally to the region above Reading where the loss of markets by the anthracite coal producers has adversely affected the economy of the region.

The economy of the Schuylkill River Basin is based upon mining, manufacture and agriculture. The coal industry, which hit a peak production of almost 100 million tons of anthracite in 1917, has recently been producing about 40 million tons a year. Competition from other fuels and operating difficulties have been largely responsible for the loss of the anthracite markets. Mining of anthracite coal, which has been the principal source of income to the upper Schuylkill Valley for more than a hundred years, is fast being replaced by manufacturing. In fact, partly because of the abundance of female labor, the accessibility of the important markets of Pennsylvania, New York and New England and the ample supply of fuel and electric power, the anthracite area has become one of the Nation's most important textile centers. It is America's greatest producer of lace goods and until the Second World War was the chief center of the silk throwing industry. Dress goods and work clothes are produced in large quantity.

The people of the anthracite area are traditionally industrious and have developed some of America's most outstanding examples of local and community enterprises which have been largely responsible for many of the new industries that are contributing to the recovery in the region.

In the rural section of the Schuylkill Basin between Reading and Philadelphia agriculture is the prevailing pursuit. The greater portion of the region other than the urban and mountainous areas is extensively developed agricultural land.

Limestone is quarried for highways or burned for lime and portland cement. Shale is dug for building brick and firebrick is manufactured from ganister rock. Trap rock, hornfels and gneiss are quarried for use as crushed and building stone. Magnesia is made from low-silica dolomite and whiting from marble.

In the Reading and Philadelphia metropolitan areas the manufacture of iron and steel and their products, textiles and clothing, paper, chemicals and allied products, and transportation equipment are the principal industries.

The region has excellent transportation facilities, being served by the Pennsylvania and Reading Railroads. A branch of the Lehigh and New England Railroad serves the anthracite industry throughout the Schuylkill coal region. The Schuylkill River Valley is thoroughly criss-crossed by an adequate system of State, county and municipal highways. Commerce on the Schuylkill River is confined to the tidal portion below Fairmount Dam. The principal commodity is petroleum and its products. Large quantities of oil are imported, processed and exported to all parts of the globe.

PRESENT AND FUTURE USES OF WATER RESOURCES

The Schuylkill River and its tributary streams are used extensively for municipal and industrial water supplies and recreation. The majority of the larger communities are supplied with water taken from surface streams, while many of the smaller municipalities and industries obtain their water supplies from underground formations.

There are approximately 45 public water supplies serving the municipalities of the Schuylkill River Basin. Forty-three of these supplies, excluding those of the Philadelphia Suburban Water Company and the City of Philadelphia, provide approximately 50 million gallons of water a day. Nine supplies are taken from wells, 16 are taken from surface sources, and 20 are taken from both wells and surface sources.

The industries in the four Counties of Schuylkill, Berks, Chester and Montgomery use approximately 150 million gallons of water a day. About 110 million gallons are obtained from surface sources and 40 million gallons from underground sources.*

The City of Philadelphia takes about half of its 340 million gallons daily average supply from the Schuylkill River. During the low flow days in October 1941 almost the entire flow in the river was used by the City. Only a few million gallons of leakage through the dam locks continued to flow downstream. The Philadelphia Suburban Water Company takes about five million gallons a day from the Pickering Creek and eight million gallons a day from the Perkiomen Creek, both tributaries of the Schuylkill River.

Most public supplies from surface streams are filtered and chlorinated, and practically all public supplies taken from underground sources are chlorinated. The greater portion of the population of the Schuylkill River Basin is within reach of a public water supply. Data on public water supplies are shown in Appendix A.

The anthracite coal industry is a large user of water in processing the coal it produces. The smaller sizes of coal are separated by the use of water. This water, as a rule, is pumped from mines and, after use in the separation process, is settled before being discharged to the streams. Huge quantities are pumped from the mines as drainage water. Recent studies by the United States Bureau of Mines indicate that an average of 19 tons of water is pumped from the mines for each ton of coal produced. This water, discharged into the streams, accounts for a substantial part of the flow of the Schuylkill River. It is acid in nature, causing the river above the junction of Maiden Creek to be acid. Water used for industrial purposes in this section of the river is generally treated to neutralize the acid.

*Commonwealth of Pennsylvania Department of Internal Affairs Bulletin. Vol. 21 - No. 3 - February 1953.

Maiden Creek, above Reading, is a highly alkaline stream which, at its confluence with the Schuylkill, neutralizes the acid mine water. Below Maiden Creek, the river is alkaline and is used extensively for municipal and industrial water supplies and recreation.

Since the Commonwealth of Pennsylvania and the Federal government have dredged the river of accumulated coal culm and silt from the coal region downstream to Philadelphia, the recreational facilities of the river have been restored and it is now extensively used for swimming, boating and fishing, especially below Maiden Creek. The Pennsylvania Fish and Game Commission has restocked this section of the river and fishing is rapidly being restored.

The use of water for agricultural purposes is very limited. Rainfall is rather uniform and generally meets agricultural requirements except during periods of severe drought. Irrigation, except in a few special instances for horticultural and nursery stock, is very limited. Should supplemental irrigation increase as it has in some areas, serious shortages could develop among existing municipal and industrial users.

The existing primary water uses and stream status are shown on Map No. 1.

POLLUTION CONTRIBUTED TO WATER RESOURCES

A summary of available data indicates there are 78 municipal* sources of pollution in the Schuylkill River Basin. These sources originate from a population of approximately 1,100,000 or about 80% of the estimated population of the area. (Population figures include that portion of Philadelphia on the Schuylkill River watershed which will be served by the Southwest plant with discharge into the Delaware River.) These municipal pollution sources also include the wastes of many industries. Forty-one of these sources involve a population of approximately 1,000,000 (700,000 of which are in Philadelphia) and discharge to the streams a pollution load estimated to be equivalent to that from a population of about 865,000 (Table A). Data are incomplete concerning the pollution load discharged from 37 sources in the smaller communities which involve a total population of about 36,000 or less than 4% of the sewered population in the basin. Of these 37 sources, population data are not available for 25, almost all of which are small communities in need of sewer systems.

The major part of the pollution load (wastes from approximately 700,000 population) is discharged into the lower part of the river just above its junction with the Delaware from the southwest section of Philadelphia for which a sewage treatment plant is under construction but has not yet been completed.

*Includes incorporated or unincorporated municipalities, other legal bodies as sanitary districts, counties, towns, significant institutions, resorts, recreational centers or other population centers.

TABLE A

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Sources of Pollution

April 1954

Municipal*

Municipalities	Sources of Pollution	Population Served by Sewerage Systems	Amount of Pollution Discharged to Watercourse (In Terms of Equivalent No. of People)**
Having data on pollution load discharged to watercourse	41	1,012,390	865,460
Having population data available (Data on pollution load to watercourse incomplete or not available)	37 (a)	35,960 (a)	Undetermined
TOTAL	78	1,048,350	-

*Includes incorporated or unincorporated municipalities, other legal bodies as sanitary districts, counties, towns, significant institutions, resorts, recreational centers, or other population centers.

**Includes industrial wastes discharged into municipal sewerage systems.

(a) Includes 25 sources for which no population data is available. Almost all are unsewered communities.

Philadelphia's Southwest plant, which will receive this sewage, is expected to have an initial pollution loading of approximately three-quarters of a million population equivalent.

Wastes from 130 industrial establishments are discharged directly to the streams. Of these, 56 sources are organic in nature and 74 inorganic (Table B).

Data concerning the population equivalent of the industrial waste discharge are not available in most cases. However, six establishments discharge a pollution load having a population equivalent of about 5,200. The 130 industries consist of 16 food processing, 12 textile, 9 paper, 12 chemical, 25 metal processing, 4 petroleum and coal processing plants, 38 coal mining operations, 5 other types of mining and 9 miscellaneous industries.

Map No. 2 shows the sources of pollution and existing treatment facilities.

DAMAGES TO WATER RESOURCES

Few streams have been as severely damaged from pollution of all sorts as has the Schuylkill River. Much of the flow in the headwaters consists of mine drainage heavily impregnated with naturally formed acids. The water is low in pH, high in sulfate hardness, iron and manganese. Aquatic life cannot exist in such an environment, and it is practically useless for any beneficial purpose without extensive treatment. Coupled with this is the other major source of pollution related to the coal industry -- the silt resulting from coal cleaning operations and erosion of culm piles. Thus with an acid stream heavily laden with culm and other sediment, little interest was shown in protecting the stream from other types of industrial wastes and from the effects caused by the discharge of municipal sewage.

Although the acid character of the stream largely corrected itself by mixing with alkaline waters below Maiden Creek, the culm kept moving downstream farther and farther until the channel became choked. Floods became worse, and during periods of flood, culm would deposit on flood plains and destroy such areas for agricultural purposes. Thus the concoction reaching the Philadelphia Water Works intake became popularly known as a "Schuylkill cocktail."

Small wonder then that the legislature declared in 1945 in the preamble to the Schuylkill Desilting Act that:

"The accumulation of waste from mining operations, industrial processes and municipal sanitation in the Schuylkill River and its tributaries has reached the point where it constitutes a menace to the health, safety and welfare of the public; has endangered and contaminated the supply of pure waters; and is primarily responsible for the frequent floods resulting in the spreading of disease and great loss of life and property.

LOCATION MAP

EXISTING PRIMARY WATER USES

- DOMESTIC WATER SUPPLY
- INDUSTRIAL WATER SUPPLY
- LIVESTOCK
- COMMERCIAL FISHING
- GAME FISHING
- SHELLFISH
- WILDLIFE
- BATHING WATER
- OTHER RECREATION
- NAVIGATION

PRESENT STREAM STATUS

- UNDESIREABLE FOR SOME EXISTING WATER USES
- NUISANCE EXISTS

Compiled from data submitted by the state water pollution control agency as of April 1954

DELAWARE RIVER BASIN
SCHUYLKILL RIVER

PRIMARY WATER USES AND STREAM STATUS

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

MAP NO. 1
April 1954

TABLE B

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Sources of Pollution

April 1954

Industrial*

Industries	Sources of Pollution (In Number of Plants)	Amount of Pollution Discharged to Watercourse (In Terms of Equivalent Number of People)**
Producing Organic Wastes (Load Known)	6 1/	5,217
Producing Organic Wastes (Load Unknown)	50 2/	Undetermined
Producing Inorganic Wastes	74	Not Applicable
TOTAL	130	-

*Industries having separate outlets discherging wastes directly to watercourse. The waste from industries which discharge into a municipal sewer system are included in the municipal discharge in Table A.

**Population Equivalent - The calculated population which would normally contribute the same amount of biochemical oxygen demand (B.O.D.) per day. A common base is 0.167 pounds of 5-day B.O.D. per capita per day.

1/ Includes 5 plants producing both organic and inorganic wastes.

2/ Includes 19 plants producing both organic and inorganic wastes.

"It is imperative for government to exercise due diligence and reasonable control, and to provide appropriate services in the manner of the development and conservation of human and natural resources.

"It is necessary to continue the proper relationships and divisions of responsibility among the Federal, State, and local levels of government under which this Nation has operated so successfully.

"It is a fundamental public right to require streams to be reasonably safe and free of pollution and other objectionable forms of contamination."

Thus was born the Schuylkill River restoration project under which the Department of Forests and Waters removed some 24 million cubic yards of culm deposits in the 76 mile stretch of river above Norristown. The Corps of Engineers, Department of the Army is presently removing an estimated 10 million cubic yards of culm deposits between Norristown and Philadelphia and the Sanitary Water Board has required the elimination of further discharge of culm and other sediments from coal mining operations together with substantial reduction in pollutional discharges from other types of industries and from municipal sewer systems.

No effort has been made to attempt to itemize in terms of dollars and cents the damages that have and are still being caused. Suffice it to say that water supplies taken from the river both for municipal and industrial use required extensive treatment; settling costs were high, and filter runs were materially shorter because of the culm and silt; chemical treatment costs were substantially increased; flood damage along the river due to deposits of culm and silt were estimated to be about $400,000 a year; practically no fish or aquatic life existed in the river, and the bed and banks were so choked with culm and silt that swimming and other recreation were next to impossible; real estate values along the river had suffered a substantial decline both from recreational and industrial desirability viewpoints; and the coal companies had been losing a valuable source of revenue by wasting large quantities of saleable products.

Prior to the initiation of the Schuylkill restoration project the navigation channel below Fairmount Dam had to be dredged continuously at an annual average cost of approximately half a million dollars. As much as two million tons a year of culm and silt have been dredged from this section of the river. The last remaining section of the river to be dredged under the restoration project, that portion comprising the Fairmount Pool in Philadelphia, is expected to be completed within a year. Thus with the completion of operations in the Fairmount Pool, the project initiated by Incodel in 1943 will have been completed.

BENEFITS RESULTING FROM POLLUTION PREVENTION AND ABATEMENT

The "Clean Streams" program of the Pennsylvania Sanitary Water Board and the Water and Power Resources Board's restoration program for the Schuylkill

River, in conformity with the legislative directive of 1945 and the reciprocal agreement for the control of pollution in the waters of the interstate Delaware River is resulting in substantial benefits to not only the municipalities, industries and people of the Schuylkill River Basin, but also the section of the Delaware River within the tidal influence of the Schuylkill River. As each step in the restoration program is accomplished, the river approaches a degree of recovery in which the water will be as good as, or better than, the water in the Delaware River immediately above the confluence of the Schuylkill.

Between Fairmount Dam and Reading the river has shown remarkable improvement. All five municipalities which take their domestic water supplies directly from the river have reported improved water quality and more economical operating conditions. Industries are benefiting from a cheaper industrial water supply through lower treatment costs and better operating conditions. Many have found that their efforts to prevent stream pollution have resulted in better plant operation and substantial savings in raw materials. Oil, which once entered the river in the waste waters of the refineries, is now recovered and used.

The coal industry, which was once said to throw away one ton of coal for every five tons mined, is now recovering even the smallest sizes of coal. Better than 90% of the pulverized coal which will pass a 200 mesh screen is recovered by the froth flotation process. This has resulted in substantial savings to the coal operators, and, in many cases, more than offsets the cost of keeping the culm from entering the streams.

The flood plain has been lowered with substantial reduction in flood damage throughout the entire length of the river. Farm lands which were depreciated because of the deposits of culm and silt during flood periods have increased in value again. Mill property abandoned or neglected because of periodic flood damage is being renovated and occupied. New industries in need of a good adequate water supply are locating along the river and others are considering sites on which to construct plants.

Although it is doubtful whether fish and aquatic life will return to the portion of the river and tributary streams affected by the discharge of acid mine water, the other sections of the river below Maiden Creek have definitely shown that fish will prosper in the new and better environment. The Pennsylvania Fish and Game Commission has been restocking this section of the river for several years, and it is reported that the fish are propagating naturally in their recently renovated home water. Fishing has become a popular pastime for Izaak Waltons for the first time in many years.

With the restoration of the river to a degree of respectability, it is surprising how quickly people recognized and accepted the opportunity to use the renewed recreational values of the river. Boating has revived in all the pools. The Felix Pool above Reading was recently the site for a regatta in which more than a hundred outboard motorboats participated. Sculling races were the featured event.

Summer cabins along the river, many of them long abandoned, have been renovated and put back in service. Many new homes are being built, and property values have increased.

POLLUTION PREVENTION MEASURES IN EFFECT

In the Schuylkill River Basin there are 78 municipalities contributing sources of pollution which involve a population of approximately 1,100,000. These figures include 700,000 population from Philadelphia which will be served by the Southwest treatment plant.

Three of the treatment plants provide primary treatment and serve a population of about 9,500. Twenty-eight secondary treatment plants serve about 250,000 persons (Table C).

No treatment facilities are provided for 47 municipal systems which serve a population of 790,000 or 72% of the total population in the basin served by municipal sewer systems. These largely represent the population which will be served by the Southwest sewage treatment plant of the City of Philadelphia which is now nearing completion, and those to be served by the City of Pottsville, the Panther Valley Sewer Authority, and the Borough of Tamaqua.

All the sewered municipalities on the Schuylkill River from Reading to Conshohocken, inclusive, have recently completed secondary treatment works excepting the Borough of Bridgeport. These treatment works provide for a population of about 197,000 people.

Above Reading there are 11 municipalities providing sewers for approximately 41,000 people, all of which have taken steps to construct treatment facilities. One plant is completed and the other ten municipalities have plans approved or in process of preparation. There are an additional eight unsewered communities in this area about half of which are currently in need of sewer systems and accompanying treatment facilities.

One hundred eighteen of the industrial establishments are served by treatment works, while no industrial waste treatment facilities are provided for 12 establishments (Table D). It is to be noted that 38 or 29% of the sources of pollution consist of coal mining operations. Other major sources of pollution are the metal and food processing, chemical and textile manufacturing industries.

Nearly all of the coal industries listed in Table D are located in the upper portion of the basin, which is the center of the great Pennsylvania anthracite coal mining industry. Thirty-eight licensed mine operators mine and process coal in the region. All have installed desilting basins or settling equipment to prevent mining and coal processing wastes from entering the streams.

-34.A-

LOCATION MAP

SOURCES OF MUNICIPAL POLLUTION

POPULATION EQUIVALENT (B.O.D.) OF WASTES DISCHARGED TO STREAM

- UNSEWERED COMMUNITIES
- 0-10,000
- 10,000-100,000
- OVER 100,000

SOURCES OF INDUSTRIAL POLLUTION

INDICATES INDUSTRIAL SOURCE OF POLLUTION WITH DIRECT DISCHARGE TO STREAM. POPULATION EQUIVALENT B.O.D. OF WASTES DISCHARGED IS NOT INDICATED.

TREATMENT FACILITIES STATUS

- TREATMENT FACILITIES PROVIDED
- NO TREATMENT FACILITIES

NOTE:

Numbers next to symbols indicate total number of sources of pollution in the area in the category designated.

Compiled from data submitted by the state water pollution control agency as of April 1954

DELAWARE RIVER BASIN
SCHUYLKILL RIVER

SOURCES OF POLLUTION AND EXISTING TREATMENT FACILITIES

U.S. DEPARTMENT OF HEALTH, EDUCATION, AND WELFARE
Public Health Service

MAP NO. 2

April 1954

TABLE C

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Existing Treatment Facilities

April 1954

Municipal*

Degree of Treatment Provided	Number of Municipalities Served	Number of Treatment Plants	Population Served
Primary	3	3	9,450
Secondary	28	28	250,370
No Treatment	47	-	788,530
TOTAL	78	31	1,048,350

*Includes incorporated or unincorporated municipalities; other legal bodies as sanitary districts, counties, towns; significant institutions, resorts, recreational centers, or other population centers.

TABLE D

DELAWARE RIVER BASIN
SCHUYLKILL RIVER

Existing Treatment Facilities

April 1954

Industrial*

Type of Industry	Number of Plants	Number of Industrial Plants Having: Treatment Facilities	No Treatment Facilities
Food and kindred products	16	13	3
Textile products	12	10	2
Paper and allied products	9	8	1
Chemical and allied	12	10	2
Primary products	5	5	0
Fabricated products	20	18	2
Petroleum and coal products	4	4	0
Coal mining	38	38	0
Other mining	5	5	0
Miscellaneous	9	7	2
TOTAL	130	118	12

*Industries having separate outlets discharging wastes directly to watercourse.

The Commonwealth of Pennsylvania has spent approximately 35 million dollars to dredge an accumulation of approximately 25 million cubic yards of coal culm and silt from the bed and banks of the river and construct four desilting basins to intercept the coal culm and silt washed by rains and flood water into the river. The Federal government, under an agreement with the State, is dredging an estimated ten million cubic yards from the river between Norristown and the Delaware River. The Corps of Engineers, Department of the Army, is now operating in the Fairmount Pool, the last non-tidal section of the river. It is expected this portion of the project will be completed early in 1955.

During the period 1946 to 1953, inclusive, 13 new sewage treatment plants were constructed and 5 existing plants were enlarged to serve a total population of more than 120,000. Three plants now under construction in three municipalities will serve a total population of 794,000. These are the Southwest plant of the City of Philadelphia which will serve a population of approximately 700,000, the City of Reading, and the Borough of Shillington.

Seventy-four new industrial waste treatment works and one enlargement were constructed during the period 1946-1953 (Table E).

In addition to those industries which constructed treatment works, there were many others which connected to municipal sewers, instituted waste prevention measures or made process changes to eliminate waste discharges.

The control of wastes discharged into the waters of the Schuylkill River watershed is under the jurisdiction of the Sanitary Water Board of the Pennsylvania Department of Health. In addition thereto, the States have enacted reciprocal legislation known as the Incodel Act which provides minimum treatment requirements for all wastes discharged into the Delaware River and the maintenance of the waters of any intrastate tributary of the Delaware immediately above its confluence with the Delaware River in a condition at least equal to that in the Delaware River immediately above the confluence of such tributary. The Incodel law enacted in Pennsylvania is Chapter 123, April 19, 1945. There is close cooperation between the Pennsylvania Department of Health and Incodel.

The program for abatement of stream pollution in Pennsylvania is authorized under the Pennsylvania Anti-Pollution Act of 1937 as amended in 1945. The first phase of the program involves the issuance of orders to municipalities and industries which are polluting the waters of the State to abate the discharges of such pollution or submit to the Board plans of corrective measures for approval and is practically completed in the Schuylkill River watershed. The second phase is concerned with the construction and operation of the required waste treatment facilities. Following approval of the detailed plans, the Board issues orders requiring construction and operation of the approved facilities on or before specified dates. New or reopened industrial establishments must provide for adequate waste treatment before beginning operations.

To assist in the first phase of its program, the State of Pennsylvania, after issuance of a permit approving the plans for sewage treatment, makes

TABLE E

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Progress in Construction of Pollution Abatement Facilities

	Municipal		Industrial	
Year	Sewage Treatment Plants Completed	Population Served	Waste Treatment Plants Completed	Amount of Waste Treated (In Terms of Equivalent No. of People)
1946	-	-	3	-
1947	1	280	14	-
1948	1	300	12	-
1949	1	250	5	-
1950	3	6,160	16	-
1951	2 (b)	7,000	11	-
1952	9 (c)	106,850	13	-
1953	1	9,800	1 (a)	-
1954 plus under construction	3	794,000	3	-

(a) Addition
(b) Includes one enlargement
(c) Includes four additions

grant-in-aid payments to the municipalities from State funds up to 50% of the cost of the plans for sewage treatment works based upon the 1942 price level. The grant-in-aid is toward the cost of the plans for sewage treatment works, including intercepting sewers, pumping stations and related appurtenances, but not lateral collecting systems. Thus far grant-in-aid has been paid to the municipalities in the Schuylkill River Basin. No funds are provided to assist in the construction of such facilities. However, the legislature in 1953 passed Act No. 339 providing for payments by the Commonwealth to municipalities which have expended money to acquire and construct sewage treatment plants in accordance with the Clean Streams program and the Act, approved the twenty-second day of June, one thousand nine hundred thirty-seven (Pamphlet Laws 1987), and making an appropriation.

"Commencing on the first day of July, one thousand nine hundred fifty-four, and annually thereafter, the Commonwealth shall pay toward the cost of operating, maintaining, repairing, replacing and other expenses relating to sewage treatment plants, an amount not to exceed two per centum (2%) of the costs for the acquisition and construction of such sewage treatment plants by municipalities and municipality authorities to control stream pollution, expended by such municipalities and municipality authorities from the effective date of the Act, approved the twenty-second day of June, one thousand nine hundred thirty-seven (Pamphlet Laws 1987), up to and including the thirty-first day of December of the year preceding the year in which such payment is made and as ascertained by the Secretary of Health and approved by the Governor, as hereinafter provided.

"The sum of two million dollars ($2,000,000), or so much thereof as may be necessary, is hereby appropriated to the Department of Health for the purposes set forth in this Act."

Specific standards have been adopted by the Pennsylvania Sanitary Water Board for certain industrial wastes including milk processing wastes, colliery silt, acid pickling waste waters, wastes arising from the manufacture of pulp, paper, paper board and similar products, oil and natural gas wells, wastes from other wells, phenolic bodies, oil bearing wastes, distillery wastes, tannery waste waters and mine drainage. The discharge of cyanides to the waters of the State is prohibited. In general, the standards set forth values representative of standard raw waste characteristics which serve as the basis upon which the required degree of treatment is applied.

The anti-pollution laws of Pennsylvania contain provisions relating to the financing of the construction of municipal sewage treatment plants. Municipalities which are ordered to construct sewage treatment plants and do not have sufficient funds on hand must acquire such funds through a bond issue. If direct obligation bonds cannot be issued because of constitutional debt limitations or failure to get consent of the electors, financing can be done by the establishment of a municipal authority to construct, improve, maintain and operate sewers and sewage treatment works. A municipal authority is created by the

governing body of the governmental subdivision by passage of an ordinance and the members of the authority are appointed by the governing body which creates the authority.* The existence of an authority is limited to 50 years and it must procure a charter from the State before it can operate. In such cases, a system of sewer rental charges is practically always adopted as the method for financing the sewage treatment facilities. The Pennsylvania Supreme Court in a recent case ruled that municipal authorities may assess charges against adjoining property owners to defray the expense of building a sewer. Financing of industrial waste treatment facilities is entirely the responsibility of the industry. In the case of the marginal industry operating in keen competition, the cost of treatment facilities is sometimes a significant item of expense.

Soil erosion is a major problem in the upper portion of the Schuylkill River Basin. Large quantities of culm and silt are washed by rain and flood waters from the culm banks and strip mining operations carried on in the anthracite regions. In other portions of the basin soil erosion is not a serious problem. Moderate sheet erosion exists in parts of Montgomery, Chester and Berks Counties. Berks and Chester Counties have established soil conservation districts which, with the help of the United States Soil Conservation Service, are establishing soil conservation practices on the land.

The Pennsylvania Department of Forests and Waters' State Forestry Department is chiefly responsible for better forest conservation in the basin. The greatest problem area lies in the coal regions where large areas have been denuded. Reforestation of these areas is a major problem.

The Interstate Commission on the Delaware River Basin has no enforcement powers. It is engaged in the formation and execution of a coordinated, unified plan looking toward the wise use, development, and control of the resources of the Delaware River Basin as a whole. Through its cooperation with Federal, State and numerous local agencies and organizations, substantial strides are being made in the pollution control program in the Delaware River Basin. Effective educational work is carried on to acquaint the public with the problems to be solved, the procedures for accomplishing the control of pollution, and the development of the overall program in the basin.

In Pennsylvania the Sanitary Water Board has an extensive educational program under way to enlist the support of the public and industry in the Board's program to control pollution of the streams. This activity is conducted through the use of periodicals, colored posters, mailing leaflets, special articles for technical publications, motion pictures, radio, press, working models of installations, the extensive use of photographs and by participation in meetings of civic, technical and other educational groups.

*Financing Sewage Treatment Works - pamphlet issued by the Sanitary Water Board, Pennsylvania Department of Health

POLLUTION PREVENTION MEASURES NEEDED

In the Schuylkill River Basin 24 new sewage treatment plants are needed to serve a population of 783,000 or about 72% of the total population in the area which has municipal sewerage facilities. In addition five municipalities can best solve their sewage treatment problems by connecting to other existing sewer systems. Five existing plants which serve a population of about 106,000 are in need of enlargement or additions and one plant serving 500 persons needs replacement. Twenty-five plants which serve a population of approximately 154,000, 14% of the population served with municipal sewerage facilities, are adequate and need no projects. The treatment needs of 18 small sources involving only a total sewered population of 650 have not been determined (Table F).

The treatment needs to serve over 90% of the sewered population of the basin will be met upon completion of the Philadelphia Southwest plant and the construction programs at Reading and Shillington.

Above Reading treatment facilities are being planned by 25 sources of pollution to service a population of about 75,000. The largest portion of the population to be served lies in the upper Schuylkill Valley centers in the Pottsville, Tamaqua and the Panther Valley region.

The municipalities in this region were not pressed for pollution abatement projects previous to the amendment of the Pennsylvania Anti-Pollution Act of 1937 by the Legislature in 1945. The amendment of 1945 prohibited the discharge of coal culm and silt from mining operations. During the time coal culm and silt were permitted to be discharged into the streams along with the acid water from mining operations, little, if any, further deleterious effects were experienced in the upper river by the discharges of municipal wastes. Following the amendment of the Act in 1945, municipalities and industries in the region were served notice to provide the treatment facilities which are now being planned or constructed.

Upon the completion of construction now underway at the City of Reading plant and by the several municipalities included in the Wyomissing Valley Joint Sewer Authority, nearly all the sources of pollution in the Reading metropolitan area will be provided with treatment facilities.

The Borough of Bridgeport is the only municipality between Reading and Philadelphia which has not provided secondary treatment facilities along the lower river. The Sanitary Water Board has referred the matter to the State Attorney General's office and the Borough has been cited by the Court to show reason why it has not complied with the order.

Data concerning industrial waste pollution abatement needs (Table G) indicate that corrective measures are needed at 22 industrial establishments, about 17% of those which discharge wastes to the streams in the basin. Of the 22 establishments in need of pollution control measures, ten need new waste treatment plants or other control methods, eight need enlargement or additions

TABLE F

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Waste Treatment Needs

April 1954

Municipal*

Needs	Number of Sources	Population Served by Facilities
New Plant	24	782,680
Connect to Municipal sewer system	5	5,200
Enlargement or additions to existing plant	5	105,800
Replace existing plant	1	450
No Project needed	25	153,570
Undetermined	18	650
TOTAL	78	1,048,350

*Includes incorporated or unincorporated municipalities; other legal bodies as sanitary districts, counties, towns; significant institutions, resorts, recreational centers or other population centers.

TABLE G

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Water Pollution Abatement Needs

April 1954

Industrial*

Needs	Number
New Treatment Plant or Other Pollution Control Measures	10
Connection to Municipal Sewer System	1
Enlargement or Additions to Existing Treatment Plant	8
Replace Existing Treatment Plant	3
No Project Needed	87
Undetermined	21
TOTAL	130

*Industries having separate outlets discharging wastes directly to watercourse.

to existing treatment facilities, one proposes to discharge its waste into the municipal sewer system and treatment works, and three need replacement of existing treatment facilities. Eighty-seven industrial plants are providing adequate treatment and there are 21 plants for which the needs have not been determined. Several of these plants have constructed treatment facilities since 1950, the effectiveness of which has not as yet been determined.

Acid mine drainage, which constitutes the major flow in the headwater areas, is by far the most damaging type of pollution at the present time. However, little is known concerning the control of this waste. Its quantity is being reduced to the extent possible through known methods of diversion of surface waters and backfilling of surface mines. The remainder must be allowed to flow until it becomes neutralized in time by mixing with alkaline waters flowing from tributory streams. Because of lack of knowledge to control this type of pollution, its discharge is largely exempt from the present Clean Streams law.

Pollution abatement needs are shown on Map No. 3.

Considerable progress has been made in the program for the control of pollution from municipal sources in the Schuylkill Basin (Table H). All the municipalities between Reading and the City of Philadelphia except the Borough of Bridgeport have completed secondary treatment facilities. Both Philadelphia and Reading have adequate facilities under construction.

The suburban Reading municipalities in the Wyomissing Valley have established an authority which has constructed a treatment plant to treat the wastes of its member communities. Shillington Borough sewers now being constructed will discharge to this plant. The three projects now under construction will serve a population of 794,000 (Table H).

Final plans have been approved for treatment facilities for 13 municipalities in the basin which will serve approximately 71,000 persons. Among these are the City of Pottsville which will receive the sewage of several adjacent communities, Hamburg Borough, and the Panther Valley Combined Sewer Commission which includes Lansford, Coaldale, Coaldale State Hospital and Summit Hill. Nine municipalities with a total population of 5,400 have reached the active planning stage. Among this group are a number of municipalities above Reading which have received notices from the Sanitary Water Board as part of the Schuylkill restoration program.

Ten municipalities representing approximately 24,000 population are in the inactive or undetermined classification. The largest of this group are the Boroughs of Tamaqua, Minersville and St. Clair.

There are 22 industries (Table I) which need projects for abatement of pollution; six are textile plants, four are food and four metal plants, three are chemical and one each are coal mining, petroleum and paper plants while

TABLE H

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Status of Municipal* Action on
Pollution Abatement Needs

April 1954

Status of Action	Number of Municipalities	Population Served
Inactive or Undetermined	10	23,800
Active Planning**	9	5,400
Final Plans Approved***	13	70,930
Under Construction	3	794,000
TOTAL	35	894,130

*Includes incorporated or unincorporated municipalities, other legal bodies as sanitary districts, counties, towns, significant institutions, resorts, recreational centers, or other large population centers.

**Includes preliminary action such as securing engineering services, making surveys, preparing plans, arranging for purchase of site, developing financial program, studying means for additional treatment, or consideration of joint treatment with industry or other municipalities.

***Includes plans approved by State Water Pollution Control Agency or final plans submitted to said Agency for approval.

TABLE I

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Current Status of Industrial* Action on
Pollution Abatement Needs

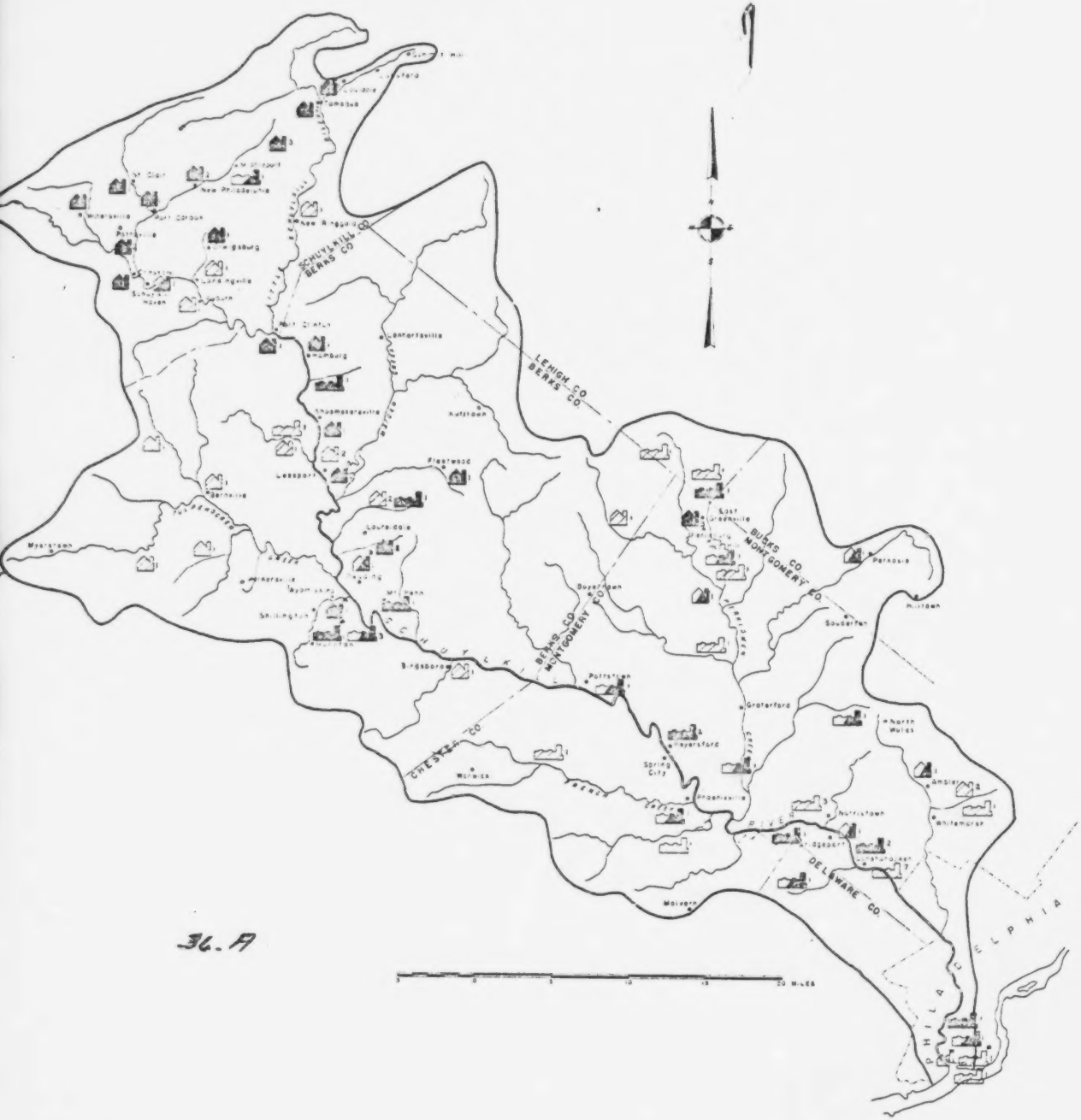
April 1954

Status of Action	Number of Industries
Inactive or Undetermined	10
Active Planning**	7
Final Plans Approved***	3
Under Construction	2
TOTAL	22

*Industries having separate outlets discharging wastes directly to watercourse.

**Includes preliminary action such as securing engineering servicesp making surveys, preparing plans, arranging for purchase of site; developing financial program, studying need for additional, joint or pre-treatment; pilot plant operation; internal process changes, or negotiations with municipality to enter municipal sewer system.

***Includes plans approved by State Water Pollution Control Agency, final plans submitted to said Agency for approval or permission granted by municipality for connection to sewer system.


SCHUYLKILL
BERKS CO
LEHIGH CO
BERKS CO
BUCKS CO
MONTGOMERY CO
BERKS CO
MONTGOMERY CO
CHESTER CO
DELAWARE CO
PHILADELPHIA
Pottstown
Norristown
Reading
Phoenixville
Royersford
Spring City
Boyertown
Quakertown
Perkasie
Souderton
Lansdale
Ambler
Whitemarsh
Conshohocken
Bridgeport
Media
Malvern
Myerstown
Lebanon
Womelsdorf
Fleetwood
Kutztown
Hamburg
Shillington
Wernersville
Sinking Spring
Mohnton
Adamstown
Ephrata
Lititz
Manheim
Mount Joy
Elizabethtown
Middletown
Hershey
Palmyra
Annville
Lebanon
Schuylkill Haven
Tamaqua
Pottsville
Orwigsburg
Auburn
Port Carbon
Mahanoy City
Shamokin
Mount Carmel
Sunbury
Lewisburg
Milton
Northumberland
Selinsgrove
Danville
Bloomsburg
Berwick
Hazleton
Lansford
Jim Thorpe
Nesquehoning
Lehighton
Slatington
Coplay
Whitehall
Allentown
Bethlehem
Catasauqua
Northampton
Coopersburg
Quakertown
Perkasie
Sellersville
Telford
Souderton
Lansdale
North Wales
Ambler
Whitemarsh
Conshohocken
Norristown
Bridgeport
Phoenixville
Royersford
Spring City
Pottstown
Boyertown
Reading
Kutztown
Fleetwood
Lenhartsville
Hamburg
Auburn
Port Carbon
Pottsville
Tamaqua

two are miscellaneous. One plant is under construction at the Price Battery Company at Hamburg and Cacoosing Dairy in West Lawn is constructing a connection to the municipal system. There are a number of industries which are constantly making changes in their waste treatment plants in order to improve the effluents or to meet changing plant processes. Three industries have final plans approved and seven others are in the active planning stage. Ten industries representing a cross section of those in the basin are in an unknown or inactive status.

Much has been done to alleviate pollution in the Schuylkill River Basin but continued activity is necessary to bring about further abatement to restore the Schuylkill River to the desired quality of water for the expected principal uses of municipal and industrial water supply and other purposes so that it will not be unfit for use as sources of water supply, harmful to fish life, or adversely affect the water in the Delaware River within tidal influence of the Schuylkill River, as set forth in the classification of zones established by the Interstate Commission on the Delaware River Basin.

A list of the municipalities and industries needing improvements as of April 1954 are set forth in Table J. Basic data as of April 1954 on the sources of municipal and industrial pollution entering the Schuylkill River system are presented in Tables 1 and 2 of the Appendixes.

TABLE J

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Municipalities and Industries Needing Improvements for Abatement of Pollution*

April 1954

PENNSYLVANIA

Ambler

Bernharts

Bridgeport
James Lees & Sons, Inc.

Brockton

(Conshohocken)
Westfield River Paper Co.

Cressona

Cumbola

East Greenville
New Perkiomen Laundry

(East Pikeland Twp.)
A. C. Roberts, Inc.

(Esterly)
A. J. Brumbach, Inc.

Fleetwood

Hamburg
Price Battery Company**

Hometown

Leesport and West Leesport

(Lower Providence Twp.)
Superior Tube Company

Middleport
K.M.F. Coal Service

Minersville

Mohnton
Berks Dyeing and Finishing Co.
Industrial Hosiery Mills, Inc.
William G. Leininger Knitting Co., Inc.

Mt. Carbon

Muhlenberg
Farmers Fairfield Dairy Company

New Philadelphia

Orwigsburg

(North Coventry Twp.)
Pottstown Manufacturing Company

*For details see Tables Nos. 1 and 2. This table does not include municipalities or industries listed with needs undetermined.

**Needed improvements are under construction.

( ) Municipalities enclosed by parentheses are not in need of improvements and only indicate the location of the industrial establishment.

PENNSYLVANIA (Cont.)

Palo Alto

Panther Valley Combined Sewer Commission
(Coaldale, Lansford, Summit Hill and
Coaldale State Hospital)

Pennsburg

Perkasie

Philadelphia (Southwest S.T.W.)**
Barrett Company
Philadelphia Gas Works

Port Carbon

Port Clinton

Pottsville

Reading**

Red Hill
Woodson Dairy

(Royersford)
Krasley Bleach & Dye Works
Floyd Wells Company

St. Clair

Schuylkill Co. Institutional District

Shillington**

Shoemakersville

Tamaqua

Tuscarora

(Upper Gwynedd Twp.)
Lansdale Tube Company

(Upper Merion Twp.)
White Pigment Corp.
Allan Wood Steel Company

(Upper Salford Twp.)
Camp Green Lane

(West Lawn)
Cacoosing Dairy**

BASIC DATA TABLES

The data as of April 1954 listed on the following Basic Data Tables were reported by the Sanitary Water Board of the Pennsylvania Department of Health. They are arranged by watershed area which enables the reader to isolate, for any particular area, the amounts and kinds of pollution being discharged and the adequacy of treatment where provided. The principal stream is listed first, starting with the sources of pollution farthest upstream and continuing down to the mouth. Each tributary along with its branches is then covered in downstream order. Those branches which receive no pollution are not listed, while those receiving municipal pollution will be found in Table 1 (Municipal) and similarly, those receiving industrial pollution in Table 2 (Industrial).

The reader is cautioned not to assume the entries as listed to be final. Changing conditions in water uses, pollution contributed, stream quality, information obtained during surveys and other circumstances, may dictate readjustments.

Table 1 applies to municipalities. Included, but not listed, are those industries discharging wastes into municipal sewers. Table 2 applies only to industries discharging directly to a watercourse.

To aid in finding the location of the various sources of pollution, a stream code and river mileage system has been devised. Each of the pollution points on any stream is listed in downstream order beneath the name of that stream, accompanied by its distance in river miles from the mouth of the stream. Tributary streams are further identified by a symbol indicating the stream to which they are tributary and a mileage number indicating in river miles the point at which they join the larger stream. With this information any sources of pollution may be located with respect to the mouth of the main stream of the basin.

Example: To locate the outfall of Minersville Borough listed in Table 1. It is found that Minersville discharges to the West Branch of the Schuylkill River at a point 7.5 miles from its mouth. The West Branch of the Schuylkill River flows into the Schuylkill River 117 miles above the Delaware River which is the zero point for the River system covered in this report. Accordingly, Minersville is 114.5 stream miles above the mouth of the Schuylkill River at its junction with the Delaware. This point of confluence is 44.5 miles from the mouth of the Delaware River at Liston Point, Delaware. Therefore, Minersville is 159 stream miles above the mouth of the Delaware.

TABLE 1
DELAWARE RIVER BASIN - SCHUYLKILL RIVER
Basic Data on Sources of Municipal* Pollution
April 1954

Name and Location	River Mile above Mouth	Population served by Severs	P.E.(BOD) Untreated Wastes	Waste Treatment Provided	P.E.(BOD) Discharged to Watercourse	Treatment Needs	Remarks
SCHUYLKILL RIVER	D-44.5						
Tuscarora	132.2	800E	800E	None	800E	New plant a)	Plans prepared
Brockton	130.4	450E	450E	None	450E	New plant a)	Engineer engaged
Middleport	128.4	1,080E	1,080E	None	1,080E	New plant a)	Plans prepared
New Philadelphia	126.2	2,000E	2,000E	None	2,000E	New plant a)	Plans prepared
Cumbola	124.8	1,500E	1,600E	None	1,600E	New plant a)	Engineer engaged
Port Carbon	122.6	3,000E	4,500E	None	4,500E	New plant a)	Engineer engaged
Palo Alto	122.4	1,900E	1,900E	None	1,900E	New plant a)	Plans prepared
Pottsville	120.4	24,530E	35,000E	None	35,000E	New plant a)	Plans approved

E - Estimated; N - Unknown; P.E. - Population Equivalent; B.O.D. - Biochemical Oxygen Demand
a) - Under order by Sanitary Water Board
* - Includes incorporated or unincorporated municipalities; other legal bodies as sanitary districts, counties, towns, significant institutions, resorts, recreational centers or other population centers.

Stream Code: Zero mileage - Schuylkill River (D-44.5) enters Delaware River at point 44.5 miles above Liston Point, mouth of Delaware River.

TABLE 1 (Cont.)

Name and Location	River Mile above Mouth	Population Served by Sewers	P.E.(BOD) Untreated Wastes	Waste Treatment Provided	P.E.(BOD) Discharged to Watercourse	Treatment Needs	Remarks
Mt. Carbon	119.5	300E	300E	None	300E	Connect to municipal sewer system	Will enter Pottsville municipal sewer system
Schuylkill Haven	116.0	4,000	N	Primary	N	None	New plant completed in 1951
Landingville	112.7	N	-	None	-	Undetermined	No public sewers; 1950 pop. census 230
Auburn	109.4	N	-	None	-	Undetermined	No public sewers; 1950 pop. census 994
Port Clinton	102.5	N	N	None	N	New plant and sewer system a)	
Hamburg	99.0	1,200E	3,000E	None	3,000E	New plant and sewer system a)	Plans approved
Shoemakersville	93.1	N	N	None	N	New plant and sewer system	1950 pop. census 1066; no public sewers
Mohrsville	91.2	N	-	None	-	Undetermined	No public sewers
Dauberville	90.1	N	-	None	-	Undetermined	No public sewers
Leesport and West Leesport	89.0	N	N	None	N	New plant and sewer system	These two villages are consolidated; no public sewers
Reading	77.5	90,000E	N	Secondary	45,000E	Additions	Additions under construction

Birdsboro	64.5	N	N	None	N	Undetermined	Part enters private sewerage system
Pottstown	54.2	24,450E	N	Secondary	3,600E	None	New plant completed in 1952
Pennhurst State School, East Vincent Twp.	45.0	3,000E	N	Secondary	450E	None	Enlargement completed in 1951
Spring City	43.4	3,100E	N	Secondary	450E	None	New plant completed in 1952
Royersford	43.4	3,000E	N	Secondary	450E	None	Additions completed in 1952
Montgomery Co. Home, Upper Providence Twp.	38.6	250E	N	Secondary	35E	None	New plant completed in 1949
Phoenixville	37.1	12,500E	N	Secondary	1,875E	None	Additions completed in 1952
Norristown	24.8	51,000E	N	Secondary	7,650E	None	Additions completed in 1952
Bridgeport	24.8	5,000E	N	Primary	3,250E	Additions	In court
Conshohocken	20.8	9,800E	N	Secondary	1,470E	None	Additions completed in 1953
Philadelphia Southwest S.T.W.	0.0	700,000E	700,000E	None	700,000E	New plant	Under construction; to be completed in 1954
LITTLE WOLF CREEK	M-2.0						
St. Clair	0.5	3,000E	N	None	3,000E	New plant a)	

Stream Code: S - Schuylkill River (D-44.5)
M - Mill Creek (S-122.6)

TABLE 1 (Cont.)

Name and Location	River Mile above Mouth	Population Served by Sewers	P.E.(BOD) Untreated Wastes	Waste Treatment Provided	P.E.(BOD Discharged to Watercourse	Treatment Needs	Remarks
WEST BRANCH SCHUYLKILL RIVER	S-117						
Minersville	7.5	4,000E	N	None	4,000E	New plant a)	
WEST WEST BRANCH SCHUYLKILL RIVER	Sw-5.0						
Cressona	1.0	1,000E	1,000E	None	1,000E	New plant and sewer system a)	Plans prepared for sewer system
UNNAMED TRIBUTARY	S-116.5						
Schuylkill Co. Institutional District	-	450E	N	Primary	150E	Replacement	Negotiating to connect to Schuylkill Haven sewer system
SILFIS RUN	S-115.9						
Orwigsburg	2.5	1,000E	1,100E	None	1,100E	New plant a)	
LITTLE SCHUYLKILL RIVER	S-102.5						
Hometown	22.5	220E	220E	None	220E	New plant and sewer system	Plans prepared
Tamaqua	21.4	10,000E	10,500E	None	10,500E	New plant	Plans prepared, not approved
PANTHER CREEK	S1-21.2						
Panther Valley Combined Sewer Commission, Lansford	5.0	26,500E	26,800E	None	26,800E	New plant a)	Includes Lansford, Coaldale, Coaldale State Hospital and Summit Hill. Plans approved

KOENIGS CREEK	Sl-10.3						
New Ringgold	-	100E	100E	None	100E	Undetermined	No public sewers; 1950 pop. census 302
MILL CREEK	S-95.1						
Hamburg State Hospital	1.0	60E	60E	Secondary	N	None	New plant completed in 1950
IRISH CREEK	S-90.0						
Centerport	2.8	50E	50E	None	50E	Undetermined	No public sewers; 1950 census pop. 226
SACONY CREEK	Ma-10.8						
Kutztown	10.0	3,100E	N	Secondary	N	None	
WILLOW CREEK	Ma-0.6						
Fleetwood	0.6	500E	500E	None	500E	New plant	Final plans approved; receiving bids for complete treatment and sewer system
LAUREL RUN	S-80.8						
Temple	3.0	N	-	None	-	Undetermined	No public sewers; will probably connect to Reading sewerage system
Laureldale	2.5	500E	N	None	N	Undetermined	Plans approved for sewer system; will probably connect to Reading sewerage system
BERNHART CREEK	S-79.0						
Muhlenberg	1.8	N	-	None	-	Connect to Municipal sewer system or new plant	Should be metropolitan sewerage system comprising Muhlenberg, Bernharts and possibly Laureldale and Temple
Bernharts	1.8	N	-	None	-		

Stream Code: Sw - West Branch Schuylkill River (S-117.0)
Sl - Little Schuylkill River (S-102.5)
Ma - Maiden Creek (S-87.0)

TABLE 1 (Cont.)

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E.(BOD) Untreated Wastes	Waste Treatment Provided	P.E.(BOD) Discharged to Watercourse	Treatment Needs	Remarks
TULPEHOCKEN CREEK	S-77.6						
Berks Co. Welfare Farm, Bern Twp.	3.0	500E	N	Secondary	N	None	New plant completed in 1952
MILL CREEK #2	Tu-25.6						
Womelsdorf	22.4	N	-	None	-	Undetermined	No public sewers; 1950 census pop. 1549
LITTLE NORTH KILL CREEK	Nk-0.7						
Strausstown	7.0	N	-	None	-	Undetermined	No public sewers; 1950 census pop. 368
Bernville	0.2	N	-	None	-	Undetermined	No public sewers; 1950 census pop. 353
SPRING CREEK	Tu-9.9						
South Mountain Manor	7.0	25-250E	N	Secondary	0-20E	None	
Wernersville State Hospital	5.0	3,000E	N	Secondary	100E	None	
FURNACE CREEK	Sp-6.6						
Robesonia	-	N	-	None	-	Undetermined	1950 census pop. 1590; no public sewers
LITTLE CACOOSING CREEK	Ca-2.5						
Wernersville	2.2	N	-	None	-	Undetermined	No public sewers; 1950 census pop. 1280

WYOMISSING CREEK	S-76.3						
Mohnton	4.8	900E	N	None	N	Sewer system and connect to municipal sewer system	To discharge to Shillington; member of Wyomissing Valley Joint Sewer Authority
Shillington	3.1	4,000E	N	None	N	Connect to municipal sewer system	Sewers under construction; member of Wyomissing Valley Joint Sewer Authority
Wyomissing Valley Joint Sewer Authority	1.5	9,500E	N	Secondary	N	None	New plant completed in 1952; serves Wyomissing and West Reading
ANTIETAM CREEK	S-66.6						
Mt. Penn	4.0	3,600E	N	Secondary	70E	None	
IRONSTONE CREEK	Mn-4.1						
Boyertown	4.4	4,000E	N	Secondary	N	None	
PERKIOMEN CREEK	S-32.8						
East Greenville	26	N	-	None	-	Sewer system and new plant	No public sewers; engineer engaged
Pennsburg	25	N	-	None	-	Sewer system and new plant	No public sewers; engineer engaged
Red Hill	24	N	-	None	-	Sewer system and new plant	No public sewers; engineer engaged
Camp Green Lane, Upper Salford Twp.	18	N	N	Secondary	N	Improvement	New plant completed in 1948

Stream Code: Tu - Tulpehocken Creek (S-77.6) Ca - Cacoosing Creek (Tu-3.6)
Nk - North Kill Creek (Tu-14.5) Mn - Manatawny Creek (S-55.0)
Sp - Spring Creek (Tu - 9.9)

TABLE 1 (Cont.)

Name and Location	River Mile Above Mouth	Population Served by Sewers	P.E.(BOD) Untreated Wastes	Waste Treatment Provided	P.E.(BOD) Discharged to Watercourse	Treatment Needs	Remarks
Eastern State Penitentiary, Gratersford	9	1,600	N	Secondary	N	None	New plant completed in 1952
Ursinus College	6.1	300E	N	Secondary	N	None	New plant completed in 1950
Collegeville	6.1	N	-	None	-	Undetermined	Engineer engaged
WEST SWAMP CREEK	P-12.2						
Bechtelsville	14.5	N	-	None	-	Undetermined	Inspection required
NORTHEAST BRANCH PERKIOMEN CREEK	P-10.7						
Perkasie	17	6,000E	N	Secondary	N	Additions a)	Also serves Sellersville
INDIAN CREEK	Pne-4.7						
Telford	4.8	1,745E	N	Secondary	260E	None	
SKIPPACK CREEK	P-2.7						
Souderton	12	4,035E	N	Secondary	605E	None	
Eagleville Sanitarium	2	280E	N	Secondary	55E	None	New plant completed in 1947

VALLEY CREEK	S-30.5						
Gulf Oil Station #7, Penn. Turnpike, Tredyffrin Twp.	2.0	1,200 design	N	Secondary	N	None	New plant completed in 1952
WISSAHICKON CREEK	S-13.2						
Ambler	12.0	4,500E	N	Secondary	700E	Enlargement	a)
Fort Washington	10.8	N	-	None	-	Undetermined	No public sewers; inspection required
Whitemarsh	9.5	N	-	None	-	Undetermined	No public sewers; inspection required
UNNAMED TRIBUTARY	Wi-17						
North Wales	1.0	3,500E	N	Secondary	500E	None	
SANDY RUN	Wi-10.1						
Abington Twp. (part)	2.0	5,800E	N	Secondary	870E	None	New plant completed in 1950

Stream Code: P - Perkiomen Creek (S-32.8)
Pne - Northeast Branch Perkiomen Creek (P-10.7)
Wi - Wissahickon Creek (S-13.2)

TABLE 2
DELAWARE RIVER BASIN - SCHUYLKILL RIVER
Basic Data on Sources of Industrial* Pollution
April 1954

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
SCHUYLKILL RIVER	D-44.5						
Mary D. Mining Co. Tuscarora	132	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream
K.M.F. Coal Service, Middleport	130	Coal Mining	Inorganic	Primary	N	Additions**	Acid mine water to stream. Treatment works completed 1947
Consolidated Mining Co., Port Carbon	122	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream
B & N Coal Co. N. Manheim Twp.	122	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947
Lohb Coal Co. Schuylkill Haven	116	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1948
A. & S. Coal Co. Schuylkill Haven	116	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1948
M & M Coal Co. N. Manheim Twp.	115	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947

Landingville Coal Co. Landingville	113	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1946
William Shoener Auburn	110	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1948
Locust Valley Coal Co., Stoudts Ferry	85	Coal Mining	Inorganic	Primary	N	None	Reclaiming coal from impounding basin
Reading Railroad Reading	77.5	Misc.	Inorganic	Minor	N	None	Grease removal
Reading Corrugated Container Corp. Reading	77.5	Paper	Organic	Primary	N	None	Treatment works completed 1952
Oakbrook Hosiery Mills, Inc. Reading	77.5	Textile	Organic	Primary	N	None	
Metropolitan Edison Co., Titus Generating Sta., Cumru Twp.	75	Misc.	Fly Ash Sanitary Sewage	Secondary	N	None	Treatment works completed 1951
Birdsboro Steel Fdry. & Machine Co. Birdsboro	64.5	Fabr. Metals	Inorganic	Secondary	N	None	Additions in 1951
E & G Brooks Iron Co., Birdsboro	64.5	Fabr. Metals	Inorganic & Organic	Secondary	N	None	Treatment works completed 1952

*Industries with separate discharges to watercourses.
**The present Clean Streams Act largely exempts acid mine drainage because of the lack of knowledge to treat this type of pollution.
N - Unknown

TABLE 2 (Cont.)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
Gudebrode Inc. West Pottsgrove Twp.	57	Textile	Organic	Intermediate	N	None	Inspection required; treatment works completed 1950
Stanley S. Flagg West Pottsgrove Twp.	57	Fabr. Metals	Inorganic	Intermediate	N	None	Inspection required; treatment works completed 1950
Doehler-Jarvis Corp. West Pottsgrove Twp.	55	Fabr. Metals	Inorganic	Intermediate	N	None	Inspection required
Pottstown Mfg. Co. N. Coventry Twp.	54.5	Fabr. Metals	Inorganic	Primary	N	Additions	Consultant engaged to prepare plans
Doehler-Jarvis Corp. Pottstown	54.2	Fabr. Metals	Inorganic	Intermediate	N	None	Treatment works completed 1950
Sunny Slope Dairy Limerick Twp.	44	Food (Dairy)	Organic	Secondary	N	None	Treatment works completed 1950
Krasley Bleach & Dye Works, Royersford	43.4	Textile	Organic & Inorganic	None	2,300E	New plant	Final plans approved
The Floyd Wells Co. Royersford	43.4	Fabr. Metals	Inorganic	None	N	New plant	Consultant to be engaged
Conn & Saul Steel Co. Royersford	43.4	Fabr. Metals	Inorganic	Primary	N	None	Treatment works completed 1948
Spring City Bleach & Dye Wks., Spring City	43.3	Textile	Organic & Inorganic	Intermediate	N	None	Treatment works completed 1952

Degers Dairy Upper Providence Twp.	30	Food (Dairy)	Organic	Secondary	N	None	Treatment works completed 1954
Ehret Magnesia Mfg. Co., Upper Merion Twp.	28	Pulp & Paper	Inorganic	Primary (Lagoon)	N	None	Inspection required; treatment works completed 1952
Refractory Insulath Corp., Upper Merion Twp.	28	Other Mining	Inorganic	Primary	N	Undetermined	Inspection required
Wilson Dairy Upper Merion Twp.	28	Food (Dairy)	Organic	None	N	Undetermined	Inspection required
Taylor Fibre Co. W. Norriton Twp.	27	Misc.	Organic & Inorganic	Intermediate	N	Undetermined	Treatment works completed 1950
Philadelphia Electric Co. W. Norriton Twp.	27	Misc.	Inorganic	Primary	N	None	Treatment works completed 1949
White Pigment Corp. Upper Merion Twp.	26	Chemical	Inorganic	None	N	New plant	Undetermined; inspection required
American Screw Co. Norristown	24.8	Chemical	Inorganic	Intermediate	N	None	Treatment works completed 1950
Norristown Magnesia & Asbestos Co. Norristown	24.8	Pulp & Paper	Organic & Inorganic	Intermediate	N	None	Treatment works completed 1951
Daring Paper Mfrs., Inc., Bridgeport	24.6	Pulp & Paper	Organic & Inorganic	Intermediate	N	Undetermined	Treatment works completed 1951

TABLE 2 (Cont.)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
Continental Diamond Fibre Co. Bridgeport	24.6	Pulp & Paper	Organic & Inorganic	Inter-mediate	N	Undetermined	Additions completed in 1951
James Lees & Sons Bridgeport	24.4	Textile	Organic & Inorganic	None	37,500E	New plant	Consultant engaged
Alan Wood Steel Co. (Blast Furnace) Upper Merion Twp.	23.5	Primary Metals	Inorganic	Inter-mediate	N	None	Abated discharge
Alan Wood Steel Co. (Sewage) Upper Merion Twp.	23.5	Primary Metals	Sanitary Sewage	Secondary	N	Additions	Plans submitted
Alan Wood Steel Co. Steel Works Div. Plymouth Twp.	23.0	Primary Metals	Inorganic (Pickling Liquor)	Inter-mediate	N	None	Discharge to abandoned quarry
Alan Wood Steel Co. Steel Works Div. Plymouth Twp.	23.0	Primary Metals	Inorganic (Mill scale & Oil)	Inter-mediate	N	None	Treatment works completed in 1950
Alan Wood Steel Co. Schuylkill Iron Wks. Conshohocken	21.5	Primary Metals	Organic & Inorganic	Inter-mediate	N	Undetermined	Treatment works completed in 1951
John Wood Mfg. Co. Conshohocken	21	Fabr. Metals	Inorganic	Inter-mediate	N	Undetermined	Treatment works completed in 1950

Philadelphia Elec. Co., West Conshohocken	20.8	Petroleum and coal Products	Organic	Inter-mediate	N	None	Treatment works completed in 1949
Merion Worsted Mills West Conshohocken	20.7	Textile	Organic	Inter-mediate	N	None	Inspection required; treatment works completed in 1950
Walker Bros. Whitemarsh Twp.	19.8	Fabr. Metals	Inorganic (Pickling Liquors)	Inter-mediate	N	Undetermined	Inspection required; treatment works completed in 1951
Lee Tire & Rubber Co. Whitemarsh Twp.	19.0	Rubber	(Sanitary Sewage) Organic	None	N	Undetermined	Inspection required
Reilly, Whiteman & Woltan Co., Whitemarsh Twp.	18.8	Chemical	Organic & Inorganic	Inter-mediate	N	Undetermined	Inspection required; treatment works completed in 1952
W. C. Hamilton & Sons, Whitemarsh Twp.	18.0	Pulp & Paper	Organic & Inorganic	Inter-mediate	N	Undetermined	Under orders of Sanitary Water Board. Treatment works completed in .950
Barrett Co. Philadelphia	5.0	Chemical	Inorganic	None	N	New plant	Under orders; Undetermined
Philadelphia Gas Works, Philadelphia	4.8	Petroleum & Coal Products	Inorganic	Primary	N	Additions	Under orders; undetermined; treatment works completed 1950
Atlantic Refining Co. Philadelphia	4.6	Petroleum & Coal Products	Organic	Inter-mediate	N	Undetermined	Under construction

TABLE 2 (Cont.)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
Gulf Oil Refining Co. Philadelphia	1.3	Petroleum & Coal Products	Organic	Primary	N	Undetermined	Treatment works completed 1947. Inspection required.
MILL CREEK	S-122.6						
Locust Valley Coal Co., Locust Valley	10.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947
Sky Top Coal Co. Mahanoy Twp.	9.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1948
Morea Mining Co. Morea	8.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to old stripping. Treatment works completed in 1948
WOLF CREEK	M-4.9						
Creek Coal Co. Wolf Creek	1.0	Coal Mining	Inorganic	Primary	N	None**	Idle now. Acid mine water to stream
LITTLE WOLF CREEK	M-2.0						
St. Clair Coal Co. St. Clair	1.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1946
PINE FOREST RUN	M-1.3						
Eagle Hill Coal Co. E. Norwegian Twp.	0.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed in 1947

WEST BRANCH SCHUYLKILL RIVER S-117.0							
Oak Hill Colliery Cass Twp.	9.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947
Jac Coal Co. Norwegian Twp.	8.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream; treatment works completed 1950
Penna (Joseph) Coal Co. Norwegian Twp.	7.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947
Cass Cont. Co. Norwegian Twp.	6.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream
Colitz Coal Co. Pottsville	5.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1948
CARP CREEK SW-7.0							
DeRenzo, Domenick Branch Twp.	0.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream; treatment works completed 1948
TRIB. TO WEST BRANCH SW-6.0							
Live Oak Coal Co. Cass Twp.	1.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947
WEST WEST BRANCH SCHUYLKILL RIVER SW-5.0							
Harold Kalodny Mng. Co., N. Manheim Twp.	4.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream

Stream Code: S - Schuylkill River (D-44.5)
M - Mill Creek (S-122.6)
SW - West Branch Schuylkill River (S-117.0)

TABLE 2 (Cont.)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
Indian Run Breaker Canfield Cont. Co. N. Manheim Twp.	3.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947
Glenworth Coal Co. N. Manheim Twp.	3.0	Coal Mining	Inorganic	Primary	N	None**	Treatment works completed in 1948
Beckville Coal Co. N. Manheim Twp.	1.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947
LYTLE CREEK	Ww-4.6						
Floss Coal Co. Cass Twp.	1.0	Coal Mining	Inorganic	Primary (Lagoon)	None	None	No discharge
Lytle Concentrated Coal Co., Cass Twp.	0.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1948
MUDDY BRANCH	Ww-2.8						
Cyclone Coal Co. Reilly Twp.	1.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream
LITTLE SCHUYLKILL RIVER	S-102.5						
Wesner Coal Co. Rush Twp.	28.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947

Mazeika Bros. Coal Co., Rush Twp.	27.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1948
Hillside Coal Co. West Penn Twp.	19.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947
S. Tamaqua Coal Pockets, W. Penn Twp.	18.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1948
Spring Creek Coal Co., W. Penn Twp.	17.5	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1950
Haven Coal & Supply Co., W. Penn Twp.	17.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream
Atlas Powder Co. Reynolds, Pa.	16.0	Chemical	Inorganic	Primary	N	None	Treatment works completed in 1952
WABASH CREEK	S1-21.4						
Auburn Coal Co. Reevesdale	2.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed in 1950
PANTHER CREEK	S1-21.2						
Coaldale Colliery L. N. Coal Co. Coaldale	4.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1947

Stream Code: Ww - West West Branch Schuylkill River (SW-5.0)
Sl - Little Schuylkill River (S-102.5)

TABLE 2 (Cont.)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
Tamaqua Colliery L. N. Coal Co. Tamaqua	1.0	Coal Mining	Inorganic	Primary	N	None**	Acid mine water to stream. Treatment works completed 1946
KERSCHNERS CREEK	S-99.0						
Price Battery Co. Hamburg	-	Chemical	Inorganic	Minor	N	New plant	Under construction
PIGEON CREEK	S-93.1						
Wolfe Dye & Bleach Wks, Shoemakersville	-	Textile	Organic & Inorganic	Primary	N	None	Treatment works completed in 1952
IRISH CREEK	S-90.0						
Paul B. Shearer & Co., Center Twp. (Berks Co.)	2.8	Food (Dairy)	Organic	Secondary	N	Undetermined	Treatment works completed in 1952
LAUREL RUN	S-80.8						
Farmers Fairfield Dairy Co. Muhlenberg Twp.	4.0	Food (Dairy)	Organic & Inorganic	None	N	New plant	Under orders of Sanitary Water Board; undetermined
Karl Lieberknecht Inc. Laureldale	2.5	Fabricated Metals	Inorganic	Intermediate	N	None	Treatment works completed in 1951

MUHLENBERG CREEK	Be-0.3							
Bowers Battery & Plug Mfg. Co. Muhlenberg Twp.	2.0	Chemical	Inorganic	Inter-mediate	N	None	Additions completed in 1953
Beryllium Corp. Muhlenberg Twp.	-	Fabricated Metals	Inorganic	Inter-mediate	N	None	Treatment works completed in 1952
CACOOSING CREEK	Tu-3.6						
Acme Paper Board Div. Federal Paper Board Co., Spring Twp.	3.5	Pulp and Paper	Organic	Primary	N	None	Treatment works completed in 1949
WYOMISSING CREEK	S-76.3						
William G. Leininger Knitting Co., Inc. Mohnton	4.8	Textile	Organic & Inorganic	Primary	535	Additions	Negotiating to enter borough sewers
Berks Dyeing & Finishing Co., Mohnton	4.8	Textile	Organic & Inorganic	Primary	537	Additions	Negotiating to enter borough sewers
Industrial Hosiery Mills, Inc. Mohnton	4.8	Textile	Organic & Inorganic	Secondary	1000E	Additions	Negotiating to enter borough sewers
Cacoosing Dairy West Lawn	4.0	Food (Dairy)	Organic	Primary	400E	Connect to Mun. SS	Under construction

Stream Code: Be - Bernhard Creek (S-79.0)
Tu - Tulpehocken Creek (S-77.6)

TABLE 2 (Cont.)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
ANTIETAM CREEK	S-66.0						
A. J. Brumbach Inc. Esterly	4.0	Textile	Organic & Inorganic	None	445	New plant	Final plans approved
FRENCH CREEK	S-37.1						
Crown Industries Inc., South Coventry Twp.	15.0	Fabricated Metals	Inorganic	None	N	Undetermined	Inspection required. Undetermined
A. C. Roberts Inc. E. Pikeland Twp.	6.	Food (Abattoir)	Organic	Secondary	N	Additions	Under orders of Sanitary Water Board
Phoenix Iron & Steel Co. Phoenixville	0.5	Fabricated Metals	Inorganic	Primary	N	None	Inspection required
PICKERING CREEK	S-34.6						
North American Graphite Corp., W. Pikeland Twp.	12	Other Mining	Inorganic	Primary (Lagoon)	N	None	Inspection required
J. B. Highman W. Pikeland Twp.	12	Food (Poultry)	Organic	None	N	Undetermined	Inspection required
BOWERS RUN	S-33.4						
Synthane Corp. Upper Providence Twp.	0.5	Chemical	Organic, Inorganic and San. Sewage	Secondary	N	None	Treatment works completed in 1951

PERKIOMEN CREEK	S-32.8						
East Greenville Dairy, East Greenville	24.5	Food (Dairy)	Organic	Subsurface Disposal	N	Undetermined	Inspection required. Treatment works Installed in 1950
New Perkiomen Laundry, East Greenville	24.5	Misc. (Laundry)	Organic	None	N	New plant	Undetermined; under orders of Sanitary Water Board
B. F. Goodrich Co. Upper Providence Twp.	5	Rubber	Inorganic	Primary (Lagoon)	N	None	-
Peerless Paper Mills Inc., Upper Providence Twp.	3	Pulp and Paper	Organic & Inorganic	Primary	N	None	Closed system
Superior Tube Co. Lower Providence Twp.	2	Fabricated Metals	Inorganic	Primary	N	Replacement	Undetermined; under orders of Sanitary Water Board
MILL CREEK	P-29.2						
Milton A. Kemmerer Milford Twp.	3.0	Food (Abattoir)	Organic	Primary	N	Undetermined	Inspection required. Treatment works completed in 1950
MACOBY CREEK	P-18.7						
Woodson Dairy Red Hill	5.0	Food (Dairy)	Organic	Subsurface Disposal	N	Replacement	Undetermined; under orders of Sanitary Water Board
Red Hill Rug Co. Red Hill	5.0	Textile	Organic & Inorganic	Primary	N	Undetermined	Inspection required

Stream Code: P - Perkiomen Creek (S-32.8)

TABLE 2 (Cont.)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
WEST SWAMP CREEK	P-12.2						
Kirscher & Cloud Tube Wks, Lower Frederick Twp.	3.0	Fabricated Metals	Organic & Inorganic	Primary	N	Undetermined	Inspection required
PLEASANT SPRING CREEK	PNe-16.3						
C. D. Moyer Co. Silverdale, Hill-town Twp.	3	Food (Abattoir)	Organic	Inter-mediate	N	None	Treatment works completed 1951
INDIAN CREEK	PNe-4.7						
Chas. J. Fehl Milltown Twp.	6.0	Food (Abattoir)	Organic	Inter mediate	N	None	Treatment works completed 1952
TOWAMENCIN CREEK	Sk-6.0						
Lansdale Tube Co. Upper Gwynedd Twp.	2.0	Misc.	Inorganic	Primary	N	Replacement	Preparing plans. Treatment works completed 1949
Hendricks Dairies Towamencin Twp.	1.5	Food (Dairy)	Organic	Secondary	N	None	Inspection required
PLYMOUTH CREEK	S-21.9						
W. A. Case & Son Mfg. Co. Plymouth Twp.	0.5	Fabricated Metals	Inorganic	Primary (Lagoon)	N	None	-

Philip Carey Mfg. Co. Plymouth Twp.	0.5	Other mining	Inorganic	Primary (Lagoon)	N	None	-
Pittsburgh Screw & Bolt Corp. Plymouth Twp.	0.5	Fabricated Metals	Inorganic	Primary	N	None	Treatment works completed 1951
GULF CREEK	S-21.0						
Westfield River Paper Co., Conshohocken	0.2	Pulp and Paper	Organic and Inorganic	None	N	New Plant	Undetermined; under orders of Sanitary Water Board
BOILING SPRINGS RUN	S-17.5						
Standard Metal Alloys Co., Whitemarsh Twp.	3.0	Fabricated Metals	Inorganic	Primary (Lagoon)	N	None	Inspection required
WISSAHICKON CREEK	S-13.2						
Sharp & Dohme, Inc. Upper Gwynedd Twp.	14	Chemical	Organic & Inorganic	Secondary	N	None	Treatment works completed 1952
Link-Belt Co. Hatfield Twp.	13	Fabricated Metals	Sanitary Sewage	Secondary	N	None	Treatment works for 1200 employees completed in 1952
Witchwood Dairies Montgomery Twp.	13	Food (Dairy)	Organic	Secondary	N	None	Treatment works completed in 1949
American Chemical Paint Co., Lower Gwynedd Twp.	12	Chemical	Inorganic & Organic	Primary (Lagoon)	N	None	Inspection required

Stream Code: PNe - Northeast Branch Perkiomen Creek (P-10.8)
Sk - Skippack Creek (P-2.8)

TABLE 2 (Cont.)

Name and Location	River Mile Above Mouth	Type of Industry	Type Waste Produced	Degree of Treatment	P.E.(BOD) Discharged to Watercourse	Pollution Abatement Needs	Remarks
Keasbey & Mattison Co. Ambler	7.0	Other mining	Inorganic	Primary	N	None	-
SANDY RUN	Wi-10.1						
Thomas Dairies Springfield Twp.	1.0	Food (Dairy)	Organic	Primary	N	Undetermined	Inspection required
Chemical Concentrates Corp., Whitemarsh Twp.	0.5	Chemical	Organic	Solids Removal	N	None	Inspection required
G. & W. H. Corson, Inc. Whitemarsh Twp.	0.5	Other Mining	Inorganic	Primary	N	None	Discharge to abandoned quarry
MINGO CREEK	S-1.5						
Regal Petroleum Products, Philadelphia	-	Petroleum & Coal Products	Organic	Primary	N	None	Treatment works completed in 1952

Stream Code: Wi - Wissahickon Creek (S-13.2)

APPENDIX A
DELAWARE RIVER BASIN
SCHUYLKILL RIVER

Public Water Supply Data

Public Water Supply	Str.	Wells	Spr.	Owner	Pop. 1950	Est. Pop. Served 1953 *1949	Av. Plant Output GPD 1953 *1949	Treatment Filt.	Treatment Chlor.	Treatment None
Amber (a)	-	X	X	M-Au.	4,565	16,000	1,040,000	X	X	-
Auburn	X	-	-	M	994	*1,700	*50,000	-	-	X
Bally	-	X	X	M	753	*600	*35,000	-	X	-
Bernville	-	X	-	P	363	*700	*100,000	-	X	-
Birdsboro	X	-	-	P	3,158	*3,200	*475,000	-	X	-
Blyth Twp. (b)	X	-	-	M-Au.	-	20,000	1,826,000	X	X	-
Boyertown	X	X	-	M	4,074	*4,300	*450,000	X	X	-
Collegeville-Trappe	-	X	-	M	1,900 773	3,500	142,000	-	X	-
E. Greenville	X	-	-	M	1,945	1,900	175,000	X	X	-
Fleetwood	-	X	X	M	2,338	*2,400	190,000	-	X	-
Hamburg	X	X	-	M	3,805	*4,000	*370,000	-	X	-
Kutztown	-	X	-	M	3,110	*3,200	*600,000	-	X	-

(a) Ambler also serves parts of Lower Gwynedd, Upper Dublin, Whitpain and Whitemarsh Twps.
(b) Blyth Twp. also serves Branchdale, Brockton, Brownsville, Cumbola, Forestville, Hecksherville, Llewellyn, Middleport, New Philadelphia, Patterson, Primrose and Tuscarora.

APPENDIX A (Cont.)

Public Water Supply	Str.	Wells	Spr.	Owner	Pop. 1950	Est. Pop. Served 1953 *1949	Av. Plant Output GPD 1953 *1949	Filt.	Chlor.	None
Lansford-Coaldale (c)	X	-	X	M-Au.	7,487 5,318	13,000	700,000	-	X	-
Lyons	-	X	X	P	-	600	*30,000	-	-	X
Minersville (d)	X	-	-	M-Au.	7,783	*12,900	*750,000	-	X	-
Mt. Penn (e)	X	X	X	M-Au.	3,635	*9,300	*350,000	X	X	-
Muhlenberg Twp. (f)	X	X	-	M-Au.	7,000	*10,700	*660,000	X	X	-
Myerstown	-	-	X	M-Au.	3,050	*2,900	*230,000	-	X	-
Norristown (g)	X	-	-	P	38,126	55,000	5,280,000	X	X	-
North Wales (h)	-	X	-	M-Au.	2,998	4,000	273,000	-	X	-
Orwigsburg	X	X	-	M	2,309	*2,300	*110,000	-	X	-
Perkasie Boro.	-	X	X	P	4,358	*4,400	164,000	X	X	-
Philadelphia	X	-	-	M	700,000	700,000##	170,000,000#	X	X	-
Philadelphpa Suburban Water Co. (i)	X	-	-	P	-	60,000##	13,000,000#	X	X	-
Phoenixville (j)	X	-	-	M	12,932	18,000	2,225,000	X	X	-
Pottstown (k)	X	-	-	M-Au.	22,589	30,000	4,000,000	X	X	-
Pottsville (l)	X	-	-	P	23,640	46,000	6,300,000	-	X	-
Reading (m)	X	-	-	M	109,320	130,000	17,500,000	X	X	-
Reading Coal & Iron Co.	X	-	-	P	-	300	15,000	-	X	-

Red Hill	-	X	X	M	914	*2,600	175,000	-	X	-
Richland	-	X	X	M	1,090	*1,000	50,000	-	-	X
Royersford-Spring City	X	-	-	P	3,862 3,258	7,100	1,015,000	X	X	-
Schuylkill Haven-Cressona	X	X	-	M	6,597 1,758	10,000	900,000	-	X	-
Schwenksville	-	X	-	P	563 1,211	1,400	50,000	-	X	-
Sellersville	X	X	-	M	2,373	*2,300	150,000	X	X	-
Shillington-Mohnton	-	X	X	M	5,059 2,004	7,300	250,000	X	X	-
Shoemakerville	-	X	-	M	1,066	*1,100	*25,000	-	-	X

(c) Lansford also serves Coaldale, Nesquehoning, New Columbus, Mauch Chunk, Rahn Twp.
(d) Minersville also serves parts of Cass, Branchtown, New Castle and Norwegian Twps.
(e) Mt. Penn also serves parts of Alsace, Lower Alsace and Exeter Twps.
(f) Muhlenberg Twp. also serves Laureldale, South Temple, Hyde Park and Spring Valley.
(g) Norristown also serves Bridgeport Boro and parts of W. Norriton, E. Norriton and Lower Providence Twps.
(h) North Wales also serves part of Upper and Lower Gwynedd Twps.
(i) Philadelphia Suburban Water Co. supplies parts of Delaware, Chester, Montgomery and Bucks Co.
(j) Phoenixville also serves part of Schuylkill Twp.
(k) Pottstown also serves part of Stowe.
(l) Pottsville also serves St. Clair, Port Carbon, Palo Alto, Mt. Carbon, Mechanicsville Boros, and parts of Norwegian, E. Norwegian, Manheim and New Castle Twps.
(m) Reading also serves Kenhorst, W. Reading, Temple Boros and parts of Shillington, Wyomissing Boros and Greenfield, Cumru and Muhlenberg Twps.
Supply Taken from Schuylkill Basin.
Estimated population served in Schuylkill Basin.

APPENDIX A (Cont.)

Public Water Supply	Str.	Wells	Spr.	Owner	Pop. 1950	Est. Pop. Served 1953 *1949	Av. Plant Output GPD 1953 *1949	Filt.	Chlor.	None
Sinking Spring (n)	-	X	-	P	1,982	*10,700	*500,000	-	X	-
Souderton	-	X	X	M	4,521	*4,300	199,000	-	X	-
Summit Hill	-	X	X	P	4,924	*5,800	*148,000	-	X	-
Tamaqua	X	X	-	M	11,508	*13,100	*1,250,000	-	-	X
Telford	-	X	-	M	528	1,800	158,000	-	X	-
Wernersville	-	X	X	M	1,280	*1,200	*75,000	-	-	X
W. Leesport	-	X	-	M	535	*500	*110,000	-	-	X
Womelsdorf (o)	-	X	X	P	1,549	3,400	120,000	-	X	-

(n) Sinking Spring also serves parts of West Lawn, Wyomissing Boros and Spring, Lower Heidelberg and South Heidelberg Twps.

(o) Womelsdorf also serves Robesonia Boro and parts of Mill Creek and Heidelberg Twps.

SUMMARY

Source	Number of Water Systems	Ownership Municipal	Ownership Private	Est. Population Served	Average Output G.P.D.	Treatment Provided: Filt. & Chlor.	Treatment Provided: Chlor. Only	Treatment Provided: No Treatment
Surface	23	17	6	1,155,100	227,551,000	13	8	2
Underground	22	15	7	79,400	4,664,000	3	14	5
Total	45	32	13	1,234,500	232,215,000	16	22	7

APPENDIX B

DELAWARE RIVER BASIN - SCHUYLKILL RIVER

Summary of U. S. Geological Survey Stream Flow Records

Gaging Station	Years of Record	Drainage Area above Gaging Station-sq.mi.	Average Daily Discharge-cfs	Maximum Discharge Date		Maximum Discharge Flow-cfs	Minimum Discharge Date		Minimum Discharge Flow-cfs
SCHUYLKILL RIVER									
at Landingville	1947-50	133	239	12/30/48		2,630	10/24/49		23
at Auburn	1947-50	160	287	12/30/48		3,330	10/4/46		32
at Berne	1947-50	355	653	12/30/48		10,400	9/2/49		31
at Pottstown	1927-50	1,147	1,849	5/23/42		50,800	8/13/30		87
at Philadelphia	1898-1912 1931-50	1,893	1903-12 1931-50 2,722*	3/1/02	app.	98,000	10/9/41	app.	280*
LITTLE SCHUYLKILL RIVER									
at Drehersville	1947-50	122	225	12/30/48		3,630	8/28/49		30

*Adjusted for diversion by City of Philadelphia for municipal water supply.

APPENDIX C

DELAWARE RIVER BASIN - SCHUYLKILL RIVER

Chemical Analyses, In Parts Per Million, Water Year Oct. 1947 to Sept. 1948*

Sampling Station	Discharge cfs	pH	Iron (Fe)	Manganese (Mn)	Chloride (Cl)	Nitrate (NO_3)	Hardness as $CaCO_3$ Total	Hardness as $CaCO_3$ Non-Carbonate	Total Acidity as H_2SO_4
SCHUYLKILL RIVER									
at Landingville									
High	1,270	5.00	4.2	7.3	13.	2.5	686	686	179
Low	48	3.85	0.07	1.3	2.5	0.0	133	133	10
Average	303	4.29	0.66	3.9	5.7	0.7	382	382	76
at Auburn									
High	1,290	5.20	4.8	7.6	9.0	3.0	658	658	148
Low	57	4.00	0.04	1.1	2.0	0.0	127	127	23
Average	339	4.38	0.54	3.7	4.2	0.7	365	365	70
at Berne									
High	2,200	4.40	6.0	5.8	9.0	3.6	501	501	122
Low	138	3.80	0.02	1.1	1.0	0.1	107	107	20
Average	758	4.12	0.50	3.0	4.3	1.2	267	267	64
at Pottstown									
High	5,830	7.2	0.14	-	15.	12.	233	196	-
Low	445	6.3	0.01	-	3.5	3.8	85	56	-
Average	2,075	6.7	0.06	-	8.1	7.4	142	108	-
at Philadelphia									
High	9,780	7.9	0.26	-	20.	13.	215	165	-
Low	598	6.6	0.01	-	5.0	4.2	76	46	-
Average	3,217	7.0	0.06	-	9.7	7.8	127	84	-
LITTLE SCHUYLKILL RIVER									
at Drehersville									
High	1,240	4.30	4.3	7.6	18.	4.9	589	589	278
Low	50	3.45	0.06	0.4	2.0	0.0	102	102	40
Average	266	3.91	0.39	3.1	8.0	1.3	311	311	122

Chemical Analyses, In Parts Per Million, Water Year Oct. 1948 to Sept. 1949*

SCHUYLKILL RIVER									
at Landingville									
High	1,960	6.30	4.30	7.6	14.	12.	633	633	162
Low	41	3.80	0.06	1.3	2.0	0.0	130	128	18
Average	257	4.47	0.32	3.9	5.5	2.0	353	352	56
at Auburn									
High	572	4.90	1.70	6.4	11.	13.	527	527	130
Low	45	3.80	0.04	1.3	2.0	0.0	141	141	20
Average	232	4.39	0.22	3.6	5.1	2.3	321	320	49
at Berne									
High	1,340	4.80	1.40	5.0	10.	8.8	475	475	147
Low	136	3.70	0.08	1.2	2.0	0.1	112	112	28
Average	605	4.17	0.20	3.1	5.0	3.2	280	279	75
at Pottstown									
High	8,209	7.50	0.22	-	15.	10.	220	173	-
Low	411	6.30	0.02	-	3.5	4.6	82	59	-
Average	1,782	6.91	0.08	-	9.0	7.5	152	113	-
at Philadelphia									
High	12,130	7.40	0.25	-	20.	10.	205	140	-
Low	591	6.40	0.03	-	5.2	4.5	73	41	-
Average	2,797	6.97	0.08	-	11.0	7.0	133	82	-
LITTLE SCHUYLKILL RIVER									
at Drehersville									
High	1,770	4.25	5.40	7.0	12.	9.6	590	590	228
Low	45	3.40	0.07	0.6	2.0	0.2	75	75	40
Average	214	3.85	0.46	3.6	5.3	2.7	323	323	120

*From "Chemical Character of Surface Waters in Pennsylvania - 1946 to 1949"
(Pennsylvania State Planning Board - Publication 23 - June 1951)

APPENDIX C (Cont.)

Chemical Analyses, In Parts Per Million, Water Year Oct. 1949 to Sept. 1950**

Sampling Station	Discharge cfs	pH	Iron (Fe)	Manganese (Mn)	Chloride (Cl)	Nitrate (NO_3)	Hardness as $CaCO_3$ Total	Hardness as $CaCO_3$ Non-Carbonate	Total Acidity as H_2SO_4
SCHUYLKILL RIVER									
at Landingville									
High	1,300	5.10	1.5	7.3	11.	11.	515	515	222
Low	49	3.65	0.05	2.1	2.4	0.2	141	141	32
Average	235	4.40	0.15	4.5	5.5	3.6	305	303	96
at Auburn									
High	1,430	4.90	0.18	6.4	9.5	13.	445	442	200
Low	63	3.75	0.02	1.0	2.0	0.4	91	91	25
Average	270	4.35	0.09	4.0	5.0	5.0	281	279	84
at Berne									
High	2,800	5.00	0.27	5.1	7.0	10.	357	357	218
Low	142	3.75	0.03	1.3	2.0	1.6	93	91	26
Average	645	4.25	0.10	3.2	4.5	4.3	218	218	86
at Pottstown									
High	6,444	7.7	0.09	-	15.	9.3	230	183	-
Low	399	6.5	0.02	-	4.0	5.2	84	62	-
Average	1,625	6.9	0.05	-	8.3	7.6	160	123	-
at Philadelphia									
High	10,280	7.9	0.12	-	23.	10.	210	156	-
Low	261	6.7	0.01	-	5.2	5.2	80	54	-
Average	2,411	7.0	0.04	-	11.	7.3	144	100	-
LITTLE SCHUYLKILL RIVER									
at Drehersville									
High	1,180	4.8	0.70	7.2	8.0	6.8	486	486	348
Low	48	3.40	0.04	0.9	1.5	0.4	71	70	40
Average	229	4.00	0.16	3.6	4.5	3.5	227	226	121

Chemical Analyses, In Parts Per Million, Water Year Oct. 1950 to Sept. 1951**

SCHUYLKILL RIVER									
at Berne									
High	4,840	4.40	0.19	5.8	8.0	9.3	363	363	220
Low	235	3.50	0.05	1.9	2.5	1.3	123	123	64
Average	949	4.05	0.10	3.2	4.9	3.5	210	210	133
at Pottstown									
High	9,230	7.2	0.40	-	13.	9.1	237	212	-
Low	539	6.4	0.02	-	4.1	3.5	103	81	-
Average	2,362	6.8	0.09	-	6.7	6.4	148	124	-
at Philadelphia									
High	21,074	7.8	0.09	-	19.	9.7	203	156	-
Low	362	6.7	0.01	-	4.5	3.8	74	56	-
Average	3,434	7.2	0.05	-	9.8	6.2	135	98	-

**From "Chemical Character of Surface Waters in Pennsylvania - 1949 to 1951"
(Pennsylvania State Planning Board - Publication 26 - Nov. 1953)

APPENDIX D

DELAWARE RIVER BASIN

SCHUYLKILL RIVER

Municipalities and Population

	Census 1950	Census 1940
BERKS COUNTY		
Albany Twp.	1,064	1,068
Alsace Twp.	1,782	1,208
Amity Twp.	2,019	1,681
Bally Boro.	753	613
Bechtelsville Boro.	603	587
Bern Twp.	2,308	1,865
Bernville Boro.	363	339
Birdsboro Boro.	3,158	3,313
Boyertown Boro.	4,074	3,983
Brecknock Twp. (0.5)	542	447
Centerport Boro.	226	191
Centre Twp.	1,622	1,328
Colebrookdale Twp.	2,224	1,949
Cumru Twp.	5,242	4,214
District Twp.	480	477
Douglass Twp.	1,843	1,410
Earl Twp.	1,470	1,127
Exeter Twp.	5,278	3,638
Fleetwood Boro.	2,338	2,254
Greenwich Twp.	1,294	1,278
Hamburg Boro.	3,805	3,717
Heidelberg Twp.	945	964
Hereford Twp.	1,169	961
Jefferson Twp.	662	660
Kenhorst Boro.	2,551	2,227
Kutztown Boro.	3,110	2,966
Lenhartsville Boro.	229	211
Longswamp Twp. (0.2)	522	478
Lower Alsace Twp.	3,718	2,877
Lower Heidelburg Twp.	1,366	1,291
Lyons Boro.	545	518
Maidencreek Twp.	1,951	1,831
Marion Twp. (0.9)	930	893
Maxatawny Twp. (0.7)	1,760	1,300
Mohnton Boro.	2,004	1,853
Mt. Penn Boro.	3,635	3,654

	Census 1950	Census 1940
BERKS COUNTY (Cont.)		
Muhlenberg Twp.	7,001	5,516
N. Heidelberg Twp.	566	601
Oley Twp.	2,144	1,957
Ontelaunee Twp.	1,413	1,152
Penn Twp.	1,215	1,173
Perry Twp.	1,272	1,122
Pike Twp.	639	565
Reading - city	109,320	110,568
Richmond Twp.	2,030	1,813
Robeson Twp.	2,893	2,679
Robesonia Boro.	1,590	1,570
Rockland Twp.	1,166	1,167
Ruscondmanor Twp.	1,538	1,229
St. Lawrence Boro.	810	825
Shoemakersville Boro.	1,066	1,081
Sinking Spring Boro.	1,982	1,861
S. Heidelberg Twp. (0.9)	3,350	2,660
Spring Twp. (0.7)	3,400	3,360
Strausstown Boro.	368	339
Temple Boro.	1,460	1,408
Tilden Twp.	1,392	1,218
Tulpehocken Twp. (0.3)	480	460
Union Twp.	1,668	1,433
Upper Bern Twp.	858	817
Upper Tulpehocken Twp.	642	602
Washington Twp.	1,316	1,352
Wernersville Boro.	1,280	1,160
W. Lawn Boro.	2,144	2,080
W. Leesport Boro.	535	489
W. Reading Boro.	5,072	4,907
Windsor Twp.	1,330	1,574
Womelsdorf Boro.	1,549	1,450
Wyomissing Boro.	4,187	3,320
Wyomissing Hills Boro.	646	508
BUCKS COUNTY		
Bedminster Twp. (0.2)	1,810	1,670
Hilltown Twp. (0.7)	2,580	2,230
Perkasie Boro.	4,358	4,121

APPENDIX D. (Cont.)

	Census 1950	Census 1940
BUCKS COUNTY (Cont.)		
Sellersville Boro.	2,373	2,115
Silverdale Boro.	384	293
Telford Boro.	528	423
W. Rockhill Twp. (0.7)	1,410	1,150
CARBON COUNTY		
Lansford Boro.	7,487	8,710
Packer Twp. (0.1)	50	60
Summitt Hill Boro	4,924	5,406
CHESTER COUNTY		
Charlestown Twp.	854	726
E. Coventry Twp.	1,499	1,304
E. Nantmeal Twp. (0.8)	530	440
E. Pikeland Twp.	1,395	976
Easttown Twp. (0.3)	1,140	765
N. Coventry Twp.	3,242	3,030
Phoenixville Boro.	12,932	12,282
Schuylkill Twp.	3,835	1,581
S. Coventry Twp.	863	679
Spring City Boro.	3,258	3,022
Tredyffrin Twp.	7,836	6,260
Upper Uwchlan Twp. (0.5)	380	345
Uwchlan Twp. (0.4)	300	240
Warwick Twp.	1,145	1,125
W. Nantmeal Twp. (0.2)	160	110
W. Pikeland Twp.	683	623
W. Vincent Twp.	1,116	808
DELAWARE COUNTY		
Radnor Twp. (0.5)	7,350	6,000
LEBANON COUNTY		
Heidelberg Twp. (0.2)	490	450
Jackson Twp. (0.8)	1,790	1,680
Millcreek Twp. (0.9)	2,200	2,070
Myerstown Boro.	3,050	2,692
N. Lebanon Twp. (0.2)	690	530

APPENDIX D (Cont.)

	Census 1950	Census 1940
LEBANON COUNTY (Cont.)		
Richland Boro	1,090	934
S. Lebanon Twp. (0.2)	900	635
LEHIGH COUNTY		
Lower Milford Twp. (0.9)	1,250	1,120
Lynn Twp. (0.9)	1,690	1,700
Upper Milford Twp. (0.6)	1,700	1,400
Weisenberg Twp. (0.3)	375	350
MONTGOMERY COUNTY		
Abington Twp. (0.3)	8,700	6,250
Ambler Boro.	4,565	3,953
Bridgeport Boro.	5,827	5,904
Collegeville Boro.	1,900	976
Conshohocken Boro.	10,922	10,776
Douglass Twp.	2,046	1,913
E. Greenville Boro.	1,945	1,776
E. Norriton Twp.	2,987	1,948
Franconia Twp.	2,774	2,040
Greenlane Boro.	550	478
Hatfield Twp. (0.4)	1,240	905
Limerick Twp.	3,290	2,769
Lower Frederick Twp.	1,620	1,099
Lower Gwynedd Twp. (0.5)	1,240	1,000
Lower Merion Twp. (0.8)	39,000	31,730
Lower Pottsgrove Twp.	3,389	1,266
Lower Providence Twp.	5,887	3,822
Lower Salford Twp.	2,290	2,075
Marlboro Twp.	1,432	1,138
Montgomery Twp. (0.2)	310	190
New Hanover Twp.	1,745	1,476
Norristown Boro.	38,126	38,181
N. Wales Boro.	2,998	2,450
Pennsburg Boro.	1,625	1,548
Perkiomen Twp.	1,211	916
Plymouth Twp.	5,118	4,380
Pottstown Boro.	22,589	20,194
Red Hill Boro.	914	881
Royersford Boro.	3,862	3,605
Salford Twp.	794	781

APPENDIX D (Cont.)

	Census 1950	Census 1940
MONTGOMERY COUNTY (Cont.)		
Schwenksville Boro.	563	483
Skippack Twp.	3,843	3,224
Soudertown Boro.	4,521	4,036
Springfield Twp.	11,403	5,603
Telford Boro.	1,514	1,324
Towamencin Twp.	1,604	1,412
Trappe Boro.	773	497
Upper Dublin Twp. (0.8)	5,300	3,700
Upper Frederick Twp.	891	702
Upper Gwynedd Twp.	2,164	1,183
Upper Hanover Twp.	1,762	1,532
Upper Merion Twp.	6,404	6,143
Upper Pottsgrove Twp.	1,173	804
Upper Providence Twp.	4,486	3,895
Upper Salford Twp.	1,119	837
W. Conshohocken Boro.	2,482	2,464
W. Norriton Twp.	4,879	3,016
Whitemarsh Twp.	5,977	4,855
Whitpain Twp.	3,063	2,451
Worcester Twp.	1,939	1,609
SCHUYLKILL COUNTY		
Auburn Boro.	994	978
Blythe Twp.	1,579	2,027
Branch Twp. (0.7)	1,290	1,440
Butler Twp. (0.1)	400	450
Cass Twp.	3,846	4,931
Coaldale Boro.	5,318	6,163
Cressona Boro.	1,758	1,695
Delano Twp. (0.5)	420	550
E. Brunswick Twp.	1,066	1,093
E. Norwegian Twp.	1,336	1,533
Foster Twp. (0.4)	350	480
Kline Twp. (0.3)	710	890
Mahanoy Twp. (0.1)	330	470
Mechanicsville Boro.	540	748
Middleport Boro.	942	1,077
Minersville Boro.	7,783	8,686
Mt. Carbon Boro.	302	335
New Castle Twp.	1,305	1,839

	Census 1950	Census 1940
SCHUYLKILL COUNTY (Cont.)		
New Philadelphia Boro.	2,200	2,453
New Ringgold Boro.	302	313
N. Manheim Twp.	2,336	2,795
Norwegian Twp.	1,532	1,697
Orwigsburg Boro.	2,309	2,182
Palo Alto Boro.	1,767	1,934
Port Carbon Boro.	3,024	3,279
Port Clinton Boro.	451	407
Pottsville - city	23,640	24,530
Rahn Twp. (0.8)	410	350
Reilley Twp. (0.2)	275	320
Rush Twp. (0.5)	1,650	1,060
Ryan Twp.	1,077	1,233
St. Claire Boro.	5,856	6,809
Schuylkill Twp.	2,078	2,323
Schuylkill Haven Boro.	6,597	6,518
S. Manheim Twp.	641	648
Tamaqua Boro.	11,508	12,486
Walker Twp.	690	736
Wayne Twp. (0.5)	780	770
W. Brunswick Twp.	1,145	1,191
W. Penn Twp. (0.3)	520	450
Population exclusive of the portion of the City of Philadelphia tributary to the Schuylkill River	674,367	619,501
Estimated one-third City of Philadelphia	700,000	650,000
TOTAL	1,374,367	1,269,501